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**THE VALUE OF VACCINE TREATMENT OF CHRONIC IN-
FLAMMATORY DISEASE OF THE ACCESSORY
SINUSES OF THE NOSE.***

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It is a common experience that following an attack of certain infectious diseases there remains a resistance to a subsequent attack. This had been recognized by physicians from the earliest times, but Jenner was the first to make practical application of this principle in the vaccination for small pox; by passing the virus of smallpox through the cow, the virulence of the virus was diminished, thus, when vaccination with this virus is performed a mild attack of the disease results. The establishment by Koch and Pasteur of the specific bacterial causes of infectious diseases stimulated the latter to attempt further protective vaccinations against anthrax in sheep, chicken cholera, and swine plague.

The general application of this protective principle of vaccination in man is beyond consideration. As, to protect against all infectious diseases, a different vaccine would have to be used for each disease and the resistance at the best is of a few months' duration, but in two epidemic diseases of common occurrence, namely, typhoid fever and cholera, brilliant results have been obtained.

If we could always determine the time of infection, and, if the incubation period were long enough, much could be done to pre-

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pare the human organism before the disease sets in, and thus avert the severe attack. Pasteur recognized this in hydrophobia, and, although he failed to find the actual virus of rabies, he recognized that the cause of the disease was situated in the central nervous system. Thus, assuming that the spinal cord and brain of an animal dead of rabies contained in a pure state the virus of this disease, he subjected these parts to a process by which the virus would be attenuated. Making an emulsion of these parts he inoculated an infected individual during the long incubation period with small daily vaccinations, increasing the amount each day and produced an immunity before the disease actually began. From this, has developed the Pasteur or vaccination treatment of rabies as we know it to-day.

In order to have a clear conception of what causes the resistance to a disease after the first attack or through vaccination, a certain knowledge of the processes of immunity is necessary. There have developed during the past thirty years two views of immunity, "the cellular" and "the humoral." The cellular view has been maintained by Metchnikoff and his followers who claim that the main power of the body to resist disease is due to the phagocytic cells which engulf the organisms and kill them. The second or humoral view has been chiefly championed by Ehrlich, who has held that the phagocytic cells play but a secondary rôle, and that the main defensive power of the body lies in the bacteriocidal and bacteriolytic powers of the blood-plasma which increase during the processes of recovery or immunization and thus produce a cure or protection as the case may be.

That these two views were not irreconcilable was suggested by Denys and Leclef, who showed that blood serum was necessary for the ingestion of bacteria by the leucocytes. Later, Wright proved beyond all doubt that the blood plasma contained a substance which must first act upon the bacteria before the leucocytes could ingest them; he called this substance "opsonin." Therefore we have a definite connection between the two views of immunity. Following the publications of Wright and his followers, the rôle played by opsonins was very much emphasized and in many cases exaggerated. That opsonins play a great rôle in immunity there can be no doubt, but there is no proof that they are the chief factor in the protection from or the cure of infectious diseases.

It has been repeatedly demonstrated that the injection of either living or dead organisms into an animal, whether human or other-

wise, causes the production of bacteriolysins, agglutinins, precipitins, and opsonins, or when toxins, as those of tetanus and diphtheria are injected, anti-toxins are formed. Thus it must be realized that, when vaccines are administered, not only are opsonins produced, but also bacteriolysins, agglutinins, etc. It is true that the protective bodies do not always develop in the same proportion, as some bacteria seem to stimulate the production of bacteriolysins more than opsonins while other bacteria may act in an opposite manner.

Although the vaccination of a healthy animal causes an increase of the protective substances which furnish a certain degree of immunity, yet, would vaccination be advantageous, or even applicable in a person already the subject of an infective process? As I (J. C. M.) have already pointed out, if one could but know when the infection occurs, and if the incubation period were long enough, much could be done to prepare the human organism before the infection fully develops, as is done with rabies. But this is quite impossible with many diseases. There are, however, some infections which are imminently suited for vaccine treatment, namely, chronic localized infections.

Although protective bodies are present in all the fluids of the body, especially in the blood-plasma and lymph, there is no proof that they are formed there. In fact, there is almost conclusive evidence that they are not formed in these tissues, but most likely by the fixed cells of the body. When a localized infection occurs, the tissues immediately surrounding the diseased area are the only ones directly affected by the invading organism, and these are in a damaged condition. They are exerting all their powers to prevent the spread of the disease and thus the healthy tissues of the rest of the body are very little stimulated to form protective substances. However, when bacteria are injected into a healthy subcutaneous tissue the virus is quickly absorbed and distributed to all the healthy tissues of the body. These tissues are thus stimulated to form protective substances which circulate in the blood-stream.

The effect of the vaccination on the local infection is to temporarily increase the vascularity of the lesion, and a local leucocytosis occurs. In this manner, more serum is present which is soon very rich in protective substances, and the bacteria are more quickly dissolved by the bacteriolysins and the opsonins prepared the organisms for ingestion by the leucocytes. Each subsequent vaccination tends to increase the protective bodies until eventually the body has ac-

quired a degree of immunity sufficient to overcome the localized infection. However, there is an important point to be accomplished to further this process, that is, the obtaining of good drainage so that the cavity will not act as a human culture tube. This is most important in the infections in which we are interested to-day, namely, chronic inflammatory diseases of the accessory sinuses of the nose.

It will be well to first review in brief the anatomy and pathology of these regions so as to better appreciate the difficulties to be overcome in effecting a cure. The antrum of Highmore, so far as its surgery is concerned, is practically a closed cavity, having but one orifice, the ostium maxillaræ, which is situated near the top of cavity. On this account drainage is very imperfect. The ostium of the frontal sinus is fortunately situated at its most dependant point: the outlet of the ethmoidal cells is also fairly well located, but the ostium-sphenoidalæ is only a few millimetres below the roof of the cavity. Besides the poor situation of the outlets of these sinuses, one or more may be completely obstructed by swelling of the mucous membrane, due to inflammation. The mucous membrane of these sinuses has normally the power of absorbing a moderate amount of exudate and in the acute stage of any inflammatory process, this power plays a large rôle in the recovery of the lesion. When, however, the mucous membrane becomes edematous and infiltrated and finally thickened with fibrous tissue, the power of re-absorbing exudate is lost, and the retention of exudate in the sinuses is accentuated on account of the narrowing of the various ostia due to swelling of the mucous membrane.

There is also another point to be considered in the pathology of chronic sinusitis. In a large percentage of cases, the mucous membrane seems to acquire a habit of excessive secretion. By this I (J. C. M.) mean the permanent hypersecretion of mucus by a membrane that has become permanently changed through a chronic inflammatory process. It is not necessary that it be greatly changed in structure, but by continually repeated stimuli, the habit of hypersecretion has become established and is really the physiological function of the changed mucous membrane, as is seen in leucorrhea due to chronic non-infected endometritis and endocervicitis. Naturally, an accurate knowledge of the bacteriology of any infectious process is necessary before vaccine treatment may be begun, as it is always important to use a vaccine made of the infecting organism from the diseased area. In short, homologous vaccines give better results than do heterologous vaccines.

The bacteriology of the inflammatory diseases of the accessory sinuses varies considerably. As a rule, such diseases are secondary to acute infections of the nose and naso-pharynx. The chief organisms causing acute rhinitis and naso-pharyngitis are the bacillus of Friedlander and members of this group, bacillus septis and the micrococcus catarrhalis. Naturally, in the acute stages of sinus inflammation these organisms are also the chief exciting causes, but, when the disease becomes more chronic, staphylococcus aureus is the most common invader and less frequently streptococcus pyogenes and the pneumococcus. I (J. C. M.) have designated these organisms "invaders" and not causative agents, which will be explained later. Thus, we may say that the chief bacteria found in chronic diseases of the accessory sinuses are the pyogenic cocci. It has been repeatedly demonstrated, both in human and laboratory animals that vaccination with these organisms will produce a distinct immunity.

The symptoms which indicate treatment in these cases are not those of suppuration or sepsis, but those of excessive or retained secretion. There is no fever nor general systemic reaction. There is no erosion or loss of substance, but, on the contrary a thickening and heaping up of the mucous membrane. There is continued and excessive secretion of mucoid or muco-purulent fluid which is very annoying to the patient and if the outlet or outlets become temporarily closed, the symptoms of fluid under pressure ensue. The importance of these facts on the treatment of chronic inflammations of the accessory sinuses will be demonstrated later. Thus, although the mechanical difficulties are great owing to the local character of the lesion, yet, from the standpoint of immunity, some relief might be expected from the vaccine treatment if infection were the chief cause of the symptoms.

The earliest practical application of vaccine therapy to the cure of certain acute and chronic forms of diseases of the nose is found in a paper by R. W. Allen, three years ago, but as the subject under consideration is that concerning the chronic form of infection, we will pass over the results obtained in the acute stage to those of the chronic, in which the frontal ethmoidal and antral sinuses were involved. At the outset this author admits that the results are less satisfactory in the chronic diseases of these areas. Unfortunately, no statistics are given, thus practically eliminating the value of the results obtained by this method of treatment. The author, however, maintains that the treatment prevented the outburst of acute attacks through raising the opsonic index.

Following this paper, we find two more appearing in 1908 and 1909, one by Butler Harris and the other by Schorr, in which each author states the probability of being able to accomplish satisfactory results with vaccine therapy in certain forms of chronic inflammation of the nasal organ without, however, being specific in their statements.

The first systematic attempt to test the value of vaccine therapy in chronic suppurative diseases of the accessory sinuses of the nose appears in an article by Beck, in which he applied this form of treatment to 4 cases of chronic suppuration, two of which involved one frontal sinus, one of pan-sinusitis and one of antral involvement. This author states that, without exception, a distinct improvement was noted, and some cases were cured, although not enough time had elapsed to be absolutely certain.

Levy, in March, 1909, reports 15 cases of accessory trouble of a chronic nature, classified as follows: Antrum of Highmore, 5; frontal sinus, 5; frontal sinus and antrum, 3; all sinuses, 1; antrum and ethmoid, 1. Results obtained were, 6 cured, 6 improved, and 3 not improved. All of the cases were chronic in their nature, and had received prolonged and faithful treatment by drainage and irrigation. Many of them had been operated upon as often as three times, the operation being usually conservative in character. The author concludes with the following statement: "That all obstinate cases in which conservative methods including so-called 'conservative operations' have been adopted, should receive the benefit of vaccine."

Upon the gratifying results obtained by these authors, we were stimulated to test the value of this treatment, especially in two cases of chronic suppurative ethmoiditis, which had not resolved under most energetic operative measures.

With this object in view, the following cases were treated with homologous vaccines:

Case 1. Mrs. A., aged 32, telegraph operator. Diagnosis: Chronic bilateral pan-sinusitis of 7 years' duration. Etiology: Following an attack of acute influenza. Bacteriology: *Culture*, pure growth of *staphylococcus aureus*; *smears* of the discharge show much mucus, many pus cells and cocci in clumps (*staphylococcus*). A vaccine was prepared from the patient's own *staphylococcus* and the first injection of 100,000,000 was given on January 22, 1910. The second injection of 200,000,000 was administered on January 28, and the third on February 5, 1910. The patient then passed

from personal observation, but the vaccination was continued every week until April 20, 1910. During the first 6 weeks there was a distinct improvement in the condition. The discharge was less abundant and not so purulent. Smears of the discharge taken on February 10, 1910, showed much mucus, a few pus cells and extremely few cocci. The present condition of the patient, however, shows very little further improvement. There is still considerable mucoid discharge and headaches persist, evidently due to the retention of secretion.

Case 2. J. J., aged 36, laborer. Diagnosis: Chronic bilateral frontal sinusitis of 10 years' duration. Etiology: Following acute rhinitis. Bacteriology: *Culture* pure growth of streptococcus pyogenes; *smears* of the discharge show much mucus and also a large number of pus cells and cocci in short chains. A vaccine was prepared from the patient's own organism and the first injection of 50,000,000 was given on January 3, 1910. The vaccinations were repeated every 7 days, gradually increasing the dose until 500,000,000 streptococci were given and at no time were any ill effects noted. In all, 14 vaccinations were given. The result in this case was a slight improvement. The character of the fluid changed from a muco-purulent to a purely mucoid fluid. On April 2, cultures were taken from the discharge but were sterile. On April 4, a similar result was obtained, but on April 6, a growth was obtained, although there were only two colonies on a large blood agar slant. Smears taken at these times showed very few pus cells and no streptococci. The discharge, however, has continued with all the distressing symptoms of hypersecretion and retention.

Case 3. (With the kind permission of Dr. W. H. Jamieson.) J. B., aged 23; occupation, maid. Diagnosis: Chronic ethmoiditis and sphenoidal sinusitis; duration, 7 years. Etiology: Following acute rhinitis. Bacteriology: *Cultures*.—A pure growth of staphylococcus aureus; *smears* of the discharge reveal a fluid containing many pus cells and cocci in clumps (*staphylococcus*). A vaccine was prepared from this staphylococcus and the first vaccination was given on January 24, 1910. This was repeated every 7 days until April 21, 1910. On February 16, a radical Killian's operation was done, but the cells appeared in fairly good condition. A microscopical examination of the mucous membrane shows a layer of fibrous tissue of a rather hyaline appearance covered by columnar ciliated epithelium and containing in places a group of mucous glands. On April 3, 1910, a culture was taken from the discharge in order

to make a fresh vaccine. Three cultures had to be taken before a growth was obtained. Smears taken at these times showed a moderate number of pus cells but no organisms. Although the character of the fluid has changed from a muco-purulent condition to one of almost a pure mucus, yet the quantity is about the same and the symptoms remain, being those of hypersecretion and retention.

Case 4. Mrs. E., aged 45, housemaid. Diagnosis: Chronic unilateral (left) frontal sinusitis of 7 years' duration; Etiology: Following acute rhinitis. Bacteriology: *Cultures* were taken 5 times before a very scanty growth of *staphylococcus aureus* was obtained; *smears* taken at these times showed a muco-purulent fluid containing a moderate number of pus cells but no bacterial. A vaccine was prepared from the patient's organism and the first vaccination of 100,000,000 *staphylococci* was given on March 2, 1910. This was repeated every seven days, the dose being gradually increased until 500,000,000 cocci in one injection were given. In all, the patient was vaccinated 8 times and no untoward reaction was observed. *Smears* taken from the discharge 6 weeks after the vaccine treatment was commenced showed a few pus cells but no bacteria. There has been slight, if any, improvement in the patient's symptoms.

A critical view of these cases makes one doubt the importance of bacterial infection in the perpetuation of these lesions. In cases 1, 2 and 3, a growth was readily obtained before the vaccine treatment was instituted. In case 4, however, the repeated negative results were very significant of the lack of bacterial infection. After treatment by homologous vaccines, a certain improvement occurred, but this was not so much in the quantity of the exudate as in its character. The smears revealed a practically pure mucoid condition of the discharge and the absence of organisms was very striking. In addition to this, the repeatedly negative results of cultures in all the cases afford strong presumptive proof that the bacteria had been destroyed by the vaccine treatment. But, in spite of this, the discharge remains and the symptoms are practically all due to this continued secretion and partial retention. The explanations of this hypersecretion can be accounted for, it seems to me (J. C. M.) by three facts: Firstly, the sub-mucous layer of the lining of these cavities has become chronically thickened and thus the re-absorbative power has been lost; secondly, the ostia have become partially closed, due to the swollen mucous membrane and thus drainage is

defective; and thirdly, due to repeated stimuli, most likely bacterial at first, the mucous membrane has acquired the habit of hypersecretion. This hypersecretion is most likely started by bacterial action, but after a time it becomes a true habit, independent of bacteria as is evidenced by its perpetuation after the cavity has been practically sterilized.

In the vaccine treatment of acute inflammation of the accessory sinuses of the nose, we have had no experience. The results of others have been very successful, but the majority of such cases recover without treatment, and it will require a large series of cases to determine whether the incidence of chronic inflammatory disease is reduced by vaccine treatment or not. There is a class of cases, however, for which vaccine therapy is particularly indicated. These are what may be called the sub-acute cases. By this I (J. C. M.) mean those cases following acute sinusitis, which give indication of becoming chronic. In such cases, the use of vaccines would most likely sterilize the cavities and thus remove the exciting cause before the chronic changes have occurred.

CONCLUSIONS (J. C. M.): 1. Vaccine treatment will sterilize the accessory sinuses of the nose when subject of chronic disease. 2. The chronic discharge of mucus from the accessory sinuses of the nose is not so much due to bacterial infection as to habit-hypersecretion. 3. The symptoms are not due to infection but to hypersecretion and retention. 4. Although vaccine therapy is a valuable adjunct to treatment, the establishment of free drainage by the removal of polypoid masses and redundant mucous membrane is more important. 5. The cases of sinusitis showing a tendency to become chronic should be treated early by homologous vaccines.

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VACCINE THERAPY IN OTOTOLOGY.*

BY HENRY O. REIK, M. D., BALTIMORE.

The scientific application of vaccine therapy, after the method suggested by Sir Almroth Wright, is of such recent origin that no one can be said to have had a large experience in its employment as yet and, in so far as otology is concerned, the entire number of cases reported in medical literature is still too small to permit of drawing any very accurate conclusions regarding its value. If I understand the purpose of this meeting to-day, however, it is desirable that I should give you, rather than personal experience, a brief summary of what has been accomplished by the use of vaccines in otology and, by deductions therefrom, attempt to forecast the future applicability of this new measure to the treatment of diseases of the ear. I shall, therefore, give little or no consideration to the underlying principles of vaccine therapy nor to the methods and technic of preparing and administering the remedy, assuming that you are all familiar with these points and confining my remarks as nearly as possible to the clinical features.

One of the earliest cases treated in this country, they believe it to have been the first, was reported by Magruder and Webb, of Colorado Springs. It was an interesting case of acute suppurative otitis media in a patient 42 years of age, first seen January 24, 1907. There was spontaneous rupture of the tympanic membrane and a pure culture of pneumococcus was obtained from the pus. The affection resisted all forms of treatment for 61 days, at which time there were symptoms indicative of commencing intracranial complications. The opsonic index for the pneumococcus was .7 and an autogenous vaccine was prepared. Two injections were given, the first of 14,000,000 killed micro-organisms and the second, 4 days later, of 20,000,000. The discharge absolutely ceased and the ear was dry on the day following the second treatment; it remained well 10 months afterward, when the report was published.

Tod and Western, in London, had applied the method to the treatment of tuberculous disease of the ear prior to that time, in one case as early as October, 1906. Their first case was one of chronic

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purulent otitis media of 9 months' duration. There was extensive glandular involvement and an open sinus in the neck. Mixed infection of tubercle with *staphylococcus aureus*. After two injections with tuberculin the ear ceased discharging but the sinus remained unhealed for 2 months. Then the injection of tuberculin and *staphylococcus* vaccine alternately produced rapid healing. The second case was a youth of 20 years with tuberculous otitis media of 6 weeks standing. His treatment was administered somewhat irregularly but he eventually recovered. Case 3 was a child 4 years old with tuberculous disease of the ear and osteo-myelitis of the tibia. After 6 months of the usual treatment a mastoid operation was performed. At that time there existed an offensive discharge, facial paralysis, enlarged glands, and, carious bone could be felt by probe. Tympano-mastoid exenteration did not cure the aural affection, the discharge continuing, and, one year later, the opsonic index being .8 to the tubercle bacillus, inoculations were given. In 3 months' time the aural discharge had stopped, the neck glands disappeared, the sinus from the tibia closed and only the facial paralysis remained.

Dr. Alice Hamilton, of Chicago, very carefully studied a series of acute aural infections associated with scarlet fever in one of the city hospitals. The patients submitted to vaccine treatment did well but another group of the same number of patients in the wards did equally well under the routine treatment of cleansing. An interesting thing in her report is the finding of the pseudo-diphtheria bacillus in 72 per cent of the 43 cases of acute scarlatinal otitis, and in 20 per cent of these in pure culture. Her opsonic work and vaccine therapy seem to have been directed principally to this organism, one, by the way, that has generally been looked upon as of secondary importance and considered as an accidental accompaniment of the pyogenic organisms that were actually doing the mischief.

At the annual meeting of the Central Section of the American Laryngological, Rhinological and Otological Society, on February 22, 1908, Joseph C. Beck described the methods of preparing vaccines and related a series of cases in which he had employed the method. This series included 4 cases of chronic purulent otitis media; 2 of double infection, *pneumococcus* and *staphylococcus*, one due to the Friedlander bacillus and one of diphtheria. All were improved by the treatment, but the published report does not contain detailed histories nor state the exact results.

Dr. W. W. Trimble, of Rosedale, Kansas, reported 5 rather interesting cases in May, 1908. The first case was one of chronic purulent otitis media following scarlet fever, the discharge having continued for 2 years; *staphylococcus aureus* was the germ present. Three injections of vaccine were given and in 12 days the patient was cured. The second case was one of 9 years' duration, *staphylococcus* infection, in which four injections sufficed to terminate the treatment. Case 3 was one of pyocyanous infection upon which treatment had no effect. A better result was obtained in the next pyocyanous case, however, the *staphylococcus albus* being here associated with this germ. It was a chronic case, of 2 years' duration, originating in an attack of scarlet fever. Three inoculations of a mixed vaccine caused disappearance of the pyocyanous, and then a pure vaccine of the *staphylococcus albus* speedily produced a cure. The fifth case was one of less chronicity but greater virulence. A streptococcal otitis media of 2 months' standing, with acute infection of the mastoid. There was a leucocytosis of 16,000, which was reduced to 12,000 after one injection of an autogenous vaccine, but a mastoid operation became necessary.

Dr. Trimble concludes his paper with an expression of his belief that "all cases of chronic suppurative otitis media in which symptoms are scarcely such as to justify (he probably meant demand) operating should be given vaccine treatment. Failure will follow in many cases, but so also does other treatment fail; on the whole this treatment has back of it good scientific principles, and without doubt, when judiciously used will afford the greatest percentage of recoveries in a given number of cases."

Dr. Ray Connor, of Detroit, has tried the method in a variety of cases and in some rather discouraging conditions, yet, it seems to the reviewer, his results were very satisfactory, although his experience has not made him an enthusiast. The first six cases were of a most unpromising type, weak and miserably nourished babies, that would probably have done badly under any form of treatment. Four of these were cured; one was a streptococcus infection, one the Friedlander bacillus and *staphylococcus*, one *staphylococcus aureus* and *albus*, and another a mixed infection of diphtheria bacillus with pneumococcus. Of the two failures, one was a scarlet fever case and the other a mixed infection of streptococcus and *staphylococcus*. The average period of treatment was 3 months. A case of chronic purulent otitis, the infection being due to pyocya-

neus mixed with staphylococcus, that had resisted all forms of treatment for 2 years, responded very satisfactorily to vaccines.

In the first case in which the vaccines were employed as after-treatment to a radical mastoid operation, there was no apparent influence upon the healing process. The next two cases, however, in which the method was used as post-operative treatment, gave better results. The first was an epidural abscess case which at the end of 6 weeks was not doing well; injections of the micrococcus catarrhalis were given and the wound showed immediate improvement and was completely closed within 3 weeks. "Another similar case of epidural abscess was treated with an autogenous streptococcus and staphylococcus aureus suspension, beginning 10 days after operation, but healed slowly and was not completely closed after three months' treatment. When, however, the injections were stopped the progress of repair retrograded rapidly and the amount of secretion increased." "In still another, simple mastoid repair went on nicely for about 2 months, when progress seemed to stop. The wound, though small, showed little tendency to close. A pure culture of staphylococcus albus was found and a few injections of vaccine closed the wound rapidly and permanently in two weeks."

Duncan, in a recent paper reports Webb as having cured two more cases of purulent otitis media, this time the infective agent being the pneumococcus, with only two injections each. At the same time he relates a very unusual and interesting experience in the treatment of an infant suffering with double suppurative otitis media, due to mixed infection of pneumococcus and staphylococcus, that was resisting ordinary treatment. As the infant was nursing, inoculations were administered to the mother, with the result that the discharge from the infant's ears lessened and one was healed after the second injection. The infant was then inoculated and a complete cure promptly resulted.

C. L. McDonald, of Cleveland, in his observations upon 100 cases treated by vaccine therapy, included three cases of staphylococcus otitis media, with two cures, one of these having suffered a persistent otorrhea for 30 years.

At the annual session of the American Laryngological, Rhinological and Otological Society, held in this city during the past week, Dr. E. W. Nagle, of Boston, presented a most satisfactory monograph upon the results of vaccine therapy in chronic suppurative otitis media. Dr. Nagle's work was of the most scientific

character and her conclusions most convincing. If I understood her, and I have to give this from memory, she had treated 40 cases; in 6 of these the suppuration had existed only a few months while the other 34 had been subject to otorrhea for periods varying from 1 to 40 years. Cure resulted in 39, the single failure being in the group of more acute conditions. She used autogenous vaccines prepared with the greatest care and the technic of treatment, as well, was conducted with skill and judgment. The micro-organisms found in her series of cases were chiefly the staphylococcus, influenza bacillus and bacilli of the proteus type.

Dr. Nagle believes that autogenous vaccines are preferable to stock preparations and emphasized the importance of killing the bacteria by the shortest exposure to the lowest temperature that would prove effective. This point was strongly endorsed by Dr. F. E. Sondern, the pathologist, of New York, who was inclined to believe the high value of her vaccines largely due to this factor.

Dr. F. C. Cobb, who had been in charge of some of the cases submitted to Dr. Nagle for vaccine treatment, and which were included in her report, testified as to the character of these infections and the fact that they were cured as described; he expressed the opinion that, in vaccine therapy "we have a very valuable adjunct to our armamentarium."

In the course of a general discussion on this paper some rather interesting points were brought out. In the first place, Dr. J. C. Beck stated that he has now treated 74 cases of aural disease by this method but that his results have not been so good; only 10 cases remaining well. He had, however, given the injections at intervals of from 7 to 10 days; whereas, Dr. Nagle had given them at average intervals of 3 days, relying rather upon her judgment of the clinical evidences of the opsonic curve than upon any fixed periods for injection. Much of Dr. Beck's work had, furthermore apparently been done with stock vaccines. A second point of discussion turned on the applicability of the method to the treatment of acute inflammatory conditions. The view generally held by Wright and other pathologists is that little would be expected from the use of this measure in acute infections because there is no apparent scientific reason for considering it appropriate. It may be well, however, to keep in mind the peculiar conditions attending some aural infections; a serious complication occurring to one who is the subject of long-standing otitis media may be an acute infection while, on the other hand, an otorrhea that has existed but a

very short time may have all the attributes of a chronic infection because the patient's ability to resist or to fight an infective process is below par. Dr. Ewing W. Day reported 6 cases of acute streptococcal infections treated by vaccine with remarkably satisfactory results. Two of these were cases of infective lepto-meningitis; in one, vaccines were given, in the other both vaccine and anti-streptococcal serum. In one of his cases the vaccine was employed as post-operative treatment after a mastoid operation, when the patient was not doing well. Dr. H. S. Hedges also reported a case of staphylococcus otitis meningitis treated during the acute stage with vaccine, with an excellent result.

Now, it would be useless, if not indeed manifestly unfair, to try to draw definite conclusions from a series of abstracted case-reports, such as I have presented here, from a number of operators working with varying types of infection and under varying circumstances. But it does seem fair to call attention to the positive results obtained by Nagle, Connor, Trimble, Magruder and Webb, McDonald and Tod and to say that their results afford considerable encouragement for further investigation. It must be kept in mind that the first application of this method to otology has been to the very worst class of cases and that the measure has been submitted to a most severe test. Tuberculous otitis media, the type that Tod dealt with, is notoriously difficult to heal; most of Connor's cases were of a desperate character, the condition of the children being such that an otologist might congratulate himself if he secured good results from any treatment whatsoever; many of the others refer to their treating cases of chronic suppurative otitis media that have resisted all other treatment for many years.

If we step outside of the realm of otology and consider for the moment some of the recent work of general surgeons and of bacteriologists experimenting with vaccines we shall learn several things of importance to those who contemplate trying the method in the treatment of diseases of the ear. In the first place, aural infections are not infrequently mixed infections; this is particularly true of chronic purulent otitis media. As to the proper course to pursue in such cases, Ohlmacher says: "In a general way it may be said that a mixed infection offers a less promising outlook than that by a single bacterial species, and still some brilliantly successful results have been obtained by inoculation in very complicated and long-standing infections. Given two, or even three, bac-

terial species, well-known as pathogenic agents, and their simultaneous appearance in the secretions of a certain lesion, it is entirely proper to inoculate with a mixed vaccine containing proper doses of the offending bacteria. Or, when the urgency is not too great, inoculation with the predominating and most likely pathogenic agent is to be first performed and, in case of unsatisfactory issue, a vaccine from the other bacterial species can be added to subsequent injections. In dealing with mixed infections of a pyogenic nature, it is necessary to follow events in the more chronic suppurations by bacteriologic analyses from time to time, and to modify the inoculations to correspond with the changes of bacterial flora in the pus, in case the therapeutic response is not satisfactory."

Secondly, having to deal often with long-existing localized inflammation of bone structure, we must not forget that such sinuses are frequently more or less encapsulated by inflammatory fibrous tissue, that their blood-supply is poor and that, in consequence, they are not so easily reached by remedies through the circulatory system. We have no right to expect vaccines to remove sequestra, cholesteatomatous masses nor areas of bone necrosis. These must be removed surgically and free drainage of the sinus or abscess cavity afforded; the experience of general surgeons with stubborn abscesses and sinuses seems to indicate that the value of surgical measures may be greatly enhanced by the after-use of vaccines, in fact, that surgical treatment is saved from failure by the assistance of this additional therapy.

Thirdly, there seems to be something for us to consider in Wright's original suggestion regarding the employment of vaccines preparatory to the introduction of surgical measures. On this point, Harris says: "I think the study of opsonins and bacterial inoculations teaches us very clearly this fact, I mean those of us who are surgeons, that under certain conditions, particularly in tubercle, it is a wise thing to ascertain what the opsonic content is before operating, and, if it is low, and, if time will permit, to artificially raise it by inoculation before operating if we wish to obtain rapid healing." There is food for thought here and reason to hope that by following this advice we may secure a higher percentage of permanent successes in our tympano-mastoid exenterations. May we not hope that in such cases of chronic suppurative otitis media as can not be cured by the vaccines, their use will at

least bring the patient to such a condition as to insure the success of an operation?

Fourthly, it seems to be the general consensus of opinion that the taking of the opsonic index is not an essential part of vaccine therapy, that its application requires a high degree of skill or much practice, that with anything short of absolute accuracy the results cannot be relied upon, and, that in so far as the treatment of a certain class of diseases is concerned, clinical evidences are sufficient to guide one in the use of the vaccines.

Fifthly, that if used with reasonable care as to dosage and, especially as to asepsis, vaccine therapy is a harmless measure and carries with it practically no serious risks.

In bringing this resumé to a close, I should like to offer for your consideration the following conclusions and suggestions bearing upon the relationship of vaccine therapy to otology:

1. The employment of vaccine therapy in otology, although having had but a limited trial so far, has been attended by such successful results as to warrant us in feeling greatly encouraged.
2. Furunculosis, with its recognized tendency to the formation of boils in crops, seems to have responded more promptly and satisfactorily to this form of treatment than to any other, and, in tuberculosis of the middle-ear, a condition heretofore so baffling to the otologist, there would seem to be good reason to believe that at last we have a controlling, curative remedy.
3. Looking into the future, there has been held out to us the enticing prospect of being able to cure without operation a larger percentage of our cases of persistent chronic, purulent otitis media, or, failing in that, of insuring success for the operative treatment of this affection.
4. The aural conditions to which this new form of treatment would appear to be reasonably applicable are: the treatment of chronic suppurative otitis media; the preparation of patients for operation, raising the opsonic index in order to facilitate rapid healing after obliteration of the gross lesions; and, the post-operative treatment of mastoiditis and its complications, where healing is delayed and the patient is unable to construct new tissue without aid.
5. While the outlook is hopeful in these several directions, we must not grow too enthusiastic as yet. We are perhaps justified in some degree of optimism but not in enthusiasm. Let us try the

method further, with fairness and judiciously, not expecting the impossible of it, for it will not entirely displace any other form of treatment; no matter how valuable it ultimately becomes, it will only be an additional therapeutic measure at our command.

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506 Cathedral Street.

VACCINE THERAPY IN OTOTOLOGY.*

BY B. ALEX. RANDALL, M. D., PHILADELPHIA.

Said in part: The applications of treatment by vaccines, auto-gogenous or standard, to diseases of the ear have been too limited in number and by too few investigators to have reached definite results. Hardly a hundred individual cases are on record and these, while encouraging especially to enthusiasts, have too many loop-holes for overestimate to carry conviction to cooler minds. Any one who has watched and shared in the rise and decline of numerous lines of treatment, can recognize the same citation of small series of successes, but probably feels that he can readily match them with results in many other lines. The permanence or uniformity of success which should mark a fundamental improvement in our therapy, has not yet appeared; and some of the investigators lay themselves open to the suspicion of being none too well posted or else too pessimistic as to the older methods.

Every aurist of experience must have often seen most fetid, chronic and disquieting cases which had improved little or not at all under the alleged care of competent men, yet became odorless or even dry under one or two treatments. They are rarely without backsliding at no very distant day; yet with renewed and prolonged success later. Since operative intervention has been so fashionable, such results have probably been less widespread or frequent; but the fault may not have been with the simple methods but with their less usual or half-hearted employment. Notable, then, as a cure after one or two inoculations may appear, it is a result that has so often been gained by local measures that the burden of proof still rests on the immunizer. Yet ear conditions are of just the local type which should lend themselves to such vaccine therapy, and vaccination in careful hands ought to be quite harmless and a real addition to our resources. My personal experience has been limited—and as much from distrust as from inertia.

The field for such therapy is in the localized cases: when an acute bacteremia is present the inoculation may be most dangerous. In tubercular cases marked change for good has promptly showed in

*Read before the Joint Meeting of the American Laryngological, American Climatological and American Otological Societies, Washington, D. C., May 4, 1910.

unprogressive or retrograding wounds, and I can warmly commend the method in cases under suspicion—the effort being rather to secure the benefit without reaction than to get confirmation of the diagnosis. Most of the testimony has been against the usual clinical value of opsonic determination, the difficulties of unexceptionable tests limiting the opsonic method to experts with abundant time, while the temperature and other indications usually suffice. Yet in mixed cases the opsonic test may be of great value in selecting the organism from which most value can be expected and also in warning against inoculation at the very time when spontaneous auto-inoculation may have caused a marked negative phase. In the mixed cases, however, combined vaccines are generally indicated.

1717 Locust Street.

Can Stammering be Treated Successfully Through the Agency of the Public Schools? E. L. KENYON, *Jour. A. M. A.*, June 4, 1910.

E. L. KENYON thinks that stammering can be corrected to a large extent in the public schools, though he admits some dubiousness of the problem. Much will have to be learned by experience. A great advantage would be derived from the fact that the disease could be taken in its beginnings, and even in its earliest beginnings, with proper enlightenment of parents. It would also be a more universal treatment than any other when fully carried out. He thinks the wisest plan, however, would be to concentrate the efforts in the beginning to a relatively small number of cases and advance the work only in the light of painstaking trial and experience. The long-continued training would also be of great advantage. Segregation of the individuals would be advisable into classes composed wholly of stammerers. He suggests that the plan of treating stammerers by the schools be put forward first, not as a universal proposal, but as a special opportunity to be taken advantage of by the parents if they wish. Then let centralized schools be chosen for carrying on the work in the best and most economical way, looking forward to a time when with proved success all stammerers could be provided for.

THE PRESENT STATUS OF VACCINE THERAPY IN DISEASES OF THE NOSE, THROAT AND EAR.*

BY JAMES ALLEN PATTERSON, M. D., COLORADO SPRINGS.

My excuse for this paper is to bring as nearly as possible the subject up to date and to help continue the investigations along this line, because, while the subject is still in its childhood, I believe it has a future, more so in some lines than in others, and a differentiation of its successes and failures should be valuable for future proceedings.

The theories and methods of vaccine therapeutics are now too well known to the profession to require any remarks upon that subject, excepting to make a distinguishing feature between stock and autogenous vaccines and the use or non-use of the opsonic index. In order to enlarge the field of investigation as much as possible I have addressed a circular letter to my colleagues in Colorado requesting reports of cases as to nature of infection and results obtained. I beg to thank the gentlemen whose names appear for their kind co-operation.

In my own cases and in most of those reported the opsonic index has not been used. We are learning the dose of vaccines largely from the empirical results. Streptococci and pneumococci are used in small ascending doses endeavoring to get little if any reactions, staphylococci have almost no dose; for deep infections larger doses can be used.

Dr. P. A. Loomis, a bacteriologist, of this city, in conversation, tells me that where only staphylococci can be obtained from chronic affections of the upper air passages, the result from vaccine of that character is liable to give less satisfaction for reasons to be subsequently mentioned.

The drawbacks to this method of treatment are: 1. The length of time necessary to prepare the vaccine. From the time the culture is taken, and incubation carried out, the isolation and standardizing of the solution and the subsequent killing of the germs, with a wait of twenty-four hours, to be sure all have been killed, consumes two to three days; much valuable time if the case under treatment is acute and of a dangerous type. 2. The uncertainty of obtaining

*Read before the meeting of the Western Section of American Laryngological, Rhinological and Otological Society, Colorado Springs, March 5, 1910.

the causative organism. In subacute and chronic conditions the secondary organisms frequently become so prolific as to obscure the offending organism. Unless the poison producing the disease is isolated the vaccine will, of course, be useless. This means subsequent efforts to obtain it and consequently more expenditure of time. In chronic diseases of the accessory sinuses of the nose, these secondary organisms are usually in so great profusion as to be a very troublesome barrier, and no doubt account for the failure in treatment in many of these cases. Here we are liable to obtain a growth of staphylococci only, an organism that is most likely a secondary affair and not the cause of the disease. 3. The interval between doses must necessarily be some days, three or four at least, another reason to consume time, which may then be most needed. 4. Even with the taking of the opsonic index which is held by most bacteriologists to be open to many errors, the uncertainty of the quantity of dosage is more or less empiric, and we may be unconsciously wasting time.

These objections as the plea of loss of time apply of course only to acute cases whose symptoms, location and time of infection are urgent. On the other hand, where cases are encountered of subacute and chronic types, where urgency is less emphatic, we have a method of treatment, when successful, of great value and a distinct advance over older lines. As an adjunct to other treatments it is worthy of our profound consideration, particularly in post-operative sinuses with continued discharge.

Allen* gives some hints. Of 42 cases of nasal catarrh the causative organisms were as follows: *Bacillus Friedlander*, 19.0 per cent; *Bacillus Influenza*, 2.4 per cent; *Bacillus Septus*, 26.2 per cent; *Micrococcus Catarrhalis*, 28.6 per cent; *Bacillus Friedlander* and *Septus*, 7.1 per cent; *Bacillus Friedlander* and *Micro. Catarrh.*, 4.7 per cent; *Bacillus Septus* and *Micro. Catarrh.*, 9.7 per cent; no definite organism, 2.4 per cent.

Considering the acute and chronic forms separately, he finds the first four mentioned organisms are causative of acute conditions; that only the *bacillus Friedlanders* is causal of chronic conditions and both it and *Micrococcus Catarrhalis* the usual causative factors in subacute conditions. Of tracheal catarrh the *bacillus septus* would appear never to set up this condition. *Bacillus Friedlander* very exceptionally, the *bacillus influenza* and *micrococcus catarrhalis* habitually.

*Vaccine Therapy and Opsonic Treatment, Second Chapter on Catarrh, Nasal and Tracheal and of Accessory Air Sinus.

Of the accessory sinuses he believes with Rhinologists that the prime infection is an acute nasal catarrh, caused by those organisms, previously enumerated as being causal and "that the Staphylococci, Streptococci and Pneumococci are secondary infections maintaining a chronic condition," which probably affords an explanation why satisfactory results are not obtained in these afflictions from the bacillus of Friedlander. His remarks concerning Streptococci and Pneumococci are not in accordance with my experience.

Allen maintains "that Chronic Nasal Catarrh is apparently always due to the bacillus of Friedlander," but as he does not go into specific classifications his deductions are not so valuable as they might otherwise be, and his claim to cure from a vaccine of this organism is mentioned only to bring forward its possibilities.

I beg to submit the following report of cases: I have abbreviated these reports for the purpose of more rapidly reviewing them, though I admit and regret that some useful hints will be missed.

OTITIS CASES.

DR. LEVY.

Case I. Location: Ot. Med. Sup. chron. Duration: Intervals 9 months. Infection: Staph. alb. Result: Nil.

Case II. Location: Ot. Med. sup. chron. et interna, intense vertigo. Duration, 2 months. Infection: T. B. No result yet.

Case III. Location: Ot. Med. sup. chron. Duration, 4 months. Infection: Strep. et staph. Result: Nil.

Case IV. Location: Ot. Med. sup. chron. Duration, 3 years nearly. Infection: Pneumo et staph. aur. Result: Cured.

Case V. Location: Ot. Med. sup. chron. et externa curettage. Duration, 6 months. Infection: Pseudo. diph. et staph aur. Result: With local treatment cure.

Case VI. Location: Ot. Med. sup. acuta bilateralis, double mastoid operation, cure, recurrence. Duration, 3 months. Infection: Pneumo. Second operation: temporary cure: again recurrence. Duration, 3 months. Infection: Staph. Result: Cured.

Case VII. Location: Ot. Med. sup. chron. bilateral. Duration, 2 months. Infection: Pyog. aur. et coli. commun. Result: Nil.

Case VIII. Location: Ot. Med. Sup. Chron. Heath operation. Duration, 5 months. Infection: Pfeifers Bacillus. Result: Nil.

Case IX. Location: Ot. Med. Sup. Chron. Ossiculectomy. Duration, 3 months. Infection: Pneumo. et pyog. Result: Improved.

DR. SOLENBERGER.

Case I. Location: Ot. Med. Sup. Acute. Duration, 3 doses. Infection: Pneumo. Result: Cure.

Case II. Location: Ot. Med. Sup. Acute Bilateral. Duration, 1 dose. Infection: Pneumo. Result: Cure.

DR. DENNIS.

Case I. Location: Ot. Med. Sup. Acuta. Duration: 1 dose. Infection: Staph. Result: Cure.

Case II. Location: Ot. Med. Sup. Acuta. Duration, 3 doses. Infection: Staph. Result: Unknown.

Case III. Location: Ot. Med. Sup. Acuta. Duration, 1 dose. Infection: Pneumo, et staph. Result: Cured slowly.

Case IV. Location: Ot. Med. Sup. Acuta. Bilateral. Duration 5 doses. Infection: Pneumo-strep. Result: Cure, 4 weeks.

Case V. Location: Ot. Med. Sup. Acuta. Mastoid operation on fourteenth day, chiefly on account of pain and erratic temp. Duration, 2 doses. Infection: Pneumo-strep. Result: Under treatment.

DR. COOPER.

Case I. Location: Ot. Med. Sup. Chron. Double, E. T. + Ads. removed. Duration, 6 months. Infection: Bac. Pyocyanous, Autogen. Result: Nil.

Case II. Location: Ot. Med. Sup. Chron. Bilateral. Duration, 3 months. Infection: Staph. pyo. aur. et alb. Autogen. Result: Nil.

Case III... Location: Ot. Med. Sup. Chron. Right Ear. Duration, 4 months. Infection: Staph. pyo. aur. autogen. Result: Nil.

Case IV. Location: Ot. Med. Sup. Acuta. Right, dry, short duration under Merc. Succinimide. Infection: Tuberculin, ascending doses. Result: Nil.

Case V. Location: Ot. Med. Sup. Chron. Left, many years. Duration, 6 months. Infection: Staph. aur. et alb. Pneumo. autogen. Result: Improved and relapsing, 13 months.

DR. CARMODY.

Case I. Location: Ot. Med. Sup. Chron. Infection: Staph. Result: Cured.

Case II. Location: Ot. Med. Sup. Chron. Infection: Staph. Result: Discharge decreased 75 per cent.

DR. BANE.

Case I. Location: Ot. Med. Sup. Acuta. cum Mastoiditis. Duration, 2 months. Infection: Strep. autogen. Result: Cured.

Case II. Location: Ot. Med. Sup. Chron. Heath operation. Breaking down lower angle mastoid wound. Duration, 11 weeks. Infection: Staph. alb. Autogen. G. N. Bacillus. Result: Cured.

DR. PATTERSON.

Case I. Location: Ot. Med. Sup. Chron. Duration, 1 month. Infection: Staph. Autogenous. Result: Nil.

SUMMARY OF OTHER OTITES CASES.

Total, 26 cases: Chronic, 18; 4 cured; 12, no result; 2 improving and relapsing. Acute: Seven cured; 1 under treatment.

SINUS CASES.

DR. SOLENBERGER.

Case I. Location: Antrum empyema acute. Infection: Pneumo. Result: Cured.

DR. DENNIS.

Case I. Location: Left antrum acute. Duration, 6 doses. Infection: Pneumo-strep. autogen. Result: Cured.

Case II. Location: Left antrum acute (from tooth). Duration, 3 doses. Infection: Staph. (stock). Result: Cured.

Case III. Location: Right antrum. Duration, 1 year. Infection: Strep. autogen. Hypo. caused abscesses; subsequently used internally. Result: Cured.

Case IV. Location: Right antrum acute. Duration, 5 doses. Infection: Friedlanders. Result: Cured.

Case V. Location: All sinuses, chronic. Polyps removed; ethmoids curetted. Duration, 2 doses Infection: Friedlanders. Autogen. Result: Cured.

Case VI. Location: Ethmoiditis. Duration, 2 months; 6 doses. Infection: Staph. pneumo. autogen. Result: Improved.

DR. CARMODY.

Case I. Location: Pansinusitis. Operation. Infection: Diplococcus; kind not stated. Result: Nil.

DR. LEVY.

Case I. Location: Chronic empyema. Right antrum opened; irrigated; drained. Duration, 3 months. Infection: Pneumo. et staph. Result: Cured.

Case II. Location: Chronic sup. frontal and ethmoid. Middle turbinal removed; repeated curettage. Duration, 2 months. Infection: Pneumo. et micro-catarrhalis. Result: Under treatment.

Case III. Location: Chronic superior frontal sinus, acute exacerbations; middle turb. removed. Duration: Feb. 13, 1909, to May 26, 1909. Infection: Micro-catarrhalis et alb. staph. Result: Pain relieved; discharge idem.

Case IV. Location: Recurring acute ethmoiditis, anterior end mid. turb. removed. Duration: Dec. 11, 1909, to date. Infection: Strep. staph. aur. et alb. No result yet.

DR. PATTERSON.

Case I. Location: Fronto-ethmoiditis. Duration, ten months. Infection: 1st Strep. 2nd. Strep-staph. 3rd. Pneumo-strep. et Micro-catarrh Autogen. Result: Nil.

Case II. Location: Chronic frontal. Internal operation two years ago. Duration, three months. Infection: Micro. Tetrad. Result: Nil.

Case III. Location: Chronic frontal. Internal operation two years ago. Duration, three months. Infection: Staph. aurius et albus. Result: Nil.

Case IV. Location: Acute fronto-ethmoid. Duration, four doses. Infection: Strep. Result: Cured.

Case V. Location: Ethmoid and antrum, acute. Duration, two doses. Infection: Pneumo-strep. Result: Cured.

DRS. LOOMIS, MAGRUDER AND PATTERSON.

Case I. Location: Chronic Sup. antrum. Duration, 3 doses. Infection: Pneumo, afterward added staph. aur. et alb. Result: Cured.

Patterson removed middle turbinal in 1906 and washed antrum through accessory, enlarging opening. Radical operation then declined.

PHARYNX AND LARYNX.

DR. LEVY.

Case I. Location: Pharyngeal ulcer. Sup. Cervical Glands. T. B. Infection; Staph. Pyog. Aur. Result: Pharynx healed; glands ceased discharging.

DR. DENNIS.

Case I. Location: Chronic Tracheitis. Duration, 4 doses. Infection: Mi- cro-catarrhalis. Result: Cure.

Case II. Location: Ulceration tonsil and pillars from typhoid fever. Duration, 1 dose. Infection: Micro-catarrhalis Strep. Result: Cure.

DR. CARMODY.

Tuberculous laryngitis, several cases, not specified. Tuberculin, Strep. Staph. Result: Nil.

DR. PATTERSON.

Case I. Location: Laryngitis and Tracheitis from Measles. Required continuous intubation for 2 weeks. Duration: 3 doses. Infection: Pneumo. Result: Cured.

Summary of Sinus Cases: 6 Acute antrum cured; 3 chronic antrum cured; 1 chronic frontal ethmoiditis cured; 5 chronic frontal sinusitis not cured; 1 ethmoiditis improved; 1 recurring ethmoiditis no result.

This summary is most instructive. All antrum cases, both acute and chronic, yielded; some, of course, after proper drainage. We know that the majority of acute antral cases will yield from opening and washing, but the latter must at times be persistent and much to the patient's annoyance. Only one chronic frontal sinusitis yielded to this treatment. Failures, 83.3; successes, 16.6 per cent.

CONCLUSIONS.

In chronic otitis the percentage of cures is sufficient to warrant the trial of vaccine therapy, preferably preceded by ossiculectomy or less radical methods of obtaining free drainage. Radical operations upon the mastoid, unless there are distinct, threatening symptoms, may thus in some cases be avoided, for we know that the result is not always absolutely satisfactory in all cases by even that method. Sinuses left from mastoid operations, relapsing mastoiditis, and even unsatisfactory results as regards cessation of discharge from the radical mastoid operation are a field for its employment.

The results in the cases of acute otitis reported are so brilliant that it seems justified to conclude there is wisdom of using vaccine to shorten the duration of the attack and avoid the possibilities of a chronic discharge.

Unfortunately too few cases are reported to show the value of the method in aborting mastoiditis of the acute types. I know some of my confrères have so used it, and I believe the field is ready, and that the results will be more than encouraging. Those obtained in the cases reported of diseases of the Antrum of Highmore, both acute and chronic, show such a high percentage of cures as to be epoch-making. On the other hand the 83.3 per cent of failures in chronic affections of the frontal sinuses make operative procedures almost imperative unless some more successful methods can be instituted to facilitate obtaining a secretion of the causative organism instead of the secondary infections, such as staphylococci.

309 North Tejon Street.

AUTO-VACCINES IN NASAL ACCESSORY SINUS INFECTION.*

BY FRANK BRAWLEY, M. D., CHICAGO.

It is my purpose to-night to make a preliminary report of some of my work on the treatment of nasal accessory sinus infections by means of auto-vaccines. I have been so much encouraged by my results that I hope to be able to stimulate others to investigate this subject so that we may determine the exact value of this treatment when used for the accessory sinuses.

My plan for obtaining the specimen of infectious material has been to thoroughly irrigate the nasal cavities with warm sterile physiological saline solution, then to pass a sterile silver tube attached to an aspirating syringe into the sinus and so withdraw the contained secretion. If direct aspiration was impossible, I obtained the pus by use of the suction device, which I presented to this society several years ago. The material is placed in a sterile bottle and sent to Dr. Thomas A. Dagg, who has made all of my vaccines. It requires four days, on the average, to obtain the finished vaccine. It is then administered about every fifth day with a sterile glass syringe. The initial dose should not be more than half the usual dose of the organism in question. For instance, if staphylococci are found, 250,000,000 are injected instead of the usual 500,000,000. If the general and local reactions are slight, the full dose is given 5 days later. An attempt was made to give the injections on the day following a day of general depression in order to clinically strike the rise in the opsonic index. If this depression occurred on the usual injection day, the patient was told to appear on the following day, provided his depression had lessened or disappeared.

Mixed infections require a smaller dosage than staphylococci, especially where diplococci or bacilli are present. It is advisable, of course, to have all organisms identified, but practically that has not been possible. I am hoping the bacteriologists will tell us why this is so. I am convinced that in many cases unimproved by vaccines the real etiologic organism was crowded out during cultivation by the more rapid and luxuriant growth of other organisms present.

*Read before the Chicago Laryngological and Otological Society, February 15, 1910.

Case 1 illustrates the necessity for proper surgical drainage of the sinuses involved before administering vaccines, and also illustrates my contention that unless all organisms found are cultivated separately the slower growth of some will be inhibited by the luxuriant growth of other organisms. In this case the first vaccine was a culture of staphylococci, while the second contained some diplococci. Several cases showed absence of organisms when cultures were made from the sinus secretion obtained during the final stages of the infection. A valuable contribution to this subject is Levy's report in the "*Annals of Otology*" for March, 1909. The report includes the results of investigators in Colorado obtained by means of a circular letter. There were fifteen accessory sinus cases reported, all of which were chronic cases, which had been faithfully treated by other methods, and of these, six were cured, six improved and three not improved.

The chief clinical points to be noted are that the sub-acute infections are most favorably influenced by the vaccines, i. e., cases which have existed for not longer than a year. The acute cases seldom need vaccines, and the chronic cases show only slight benefit. In chronic cases the infected cells seem to be walled off, as it were, and do not produce a general toxemia. This exclusion from the general circulation doubtless reduces the reparative processes in the cells and prevents their stimulation by means of vaccines. The absence of temperature usually seen in the latter class of cases makes it impossible to use this symptom to determine the proper time for the injection. Where the temperature is noted, however, the injection should be given at the lowest point of the curve.

Case I. Miss L., aged 35 years. Examined August 30, 1907. Had offensive discharge from the right nostril for two years, accompanied by temporo-occipital headache—nose tender to touch from outside. Secretion was seen coming from the right middle meatus into the choana. The bulla ethmoidalis was infected together with the frontal sinus and the antrum. After resection of the anterior third of the middle turbinate body and removal of the nasal wall of the bulla, there was much relief and copious drainage. Irrigation of the sinuses rapidly ended the infection in all but the antrum which became very active following an acute rhinitis. Irrigation of the antrum for about seven weeks, from one to three times weekly, produced no permanent cessation of secretion and several acute attacks or relapses occurred, once involving the frontal sinus. An auto-vaccine showing staphylococcus *albus* and *aureus* was given in five hundred million doses every seventh or eighth day for five

weeks, without result. The wall of the inferior meatus was then removed and proper drainage established, after which vaccine was again administered with complete cure in two months. The second auto-vaccine contained a few diplococci.

Case II. Mrs. M., aged 49 years. Examined September 9, 1908. Gave history of head pains for three years, indefinite as to location, but described as a skull pain. Occasional "colds" but no nasal discharge and normal sense of smell. No local tenderness about accessory sinuses. Septal perforation anteriorly. Some polypoid degeneration at tip of the left middle turbinal, and turbinal swollen and boggy. After shrinking the left middle turbinal and applying the suction pump, pus was withdrawn from the corresponding meatus in large quantity. The anterior third of the middle turbinal was resected and the frontal sinus probed and irrigated and trikresol solution 1-200 forced into the sinus.

September 14, 1909.—This treatment relieved the headache almost entirely and was continued about one month without controlling the secretion. October 12, 1909, $\frac{1}{2}$ cc. of an auto-vaccine showing staphylococcus albus was injected. The ethmoidal bulla was opened with negative findings. Two acute stages or relapses interfered materially with the progress of the case, as the patient was not able to afford proper surroundings and worked very hard and suffered considerable exposure. The discharge gradually lessened, and January 26, 1909, while under treatment again for the second relapse no bacteria were found in the secretion washed from the sinus. There was rapid lessening of the discharge from the time the vaccine was used. The vaccine dosage was increased gradually to $1\frac{1}{2}$ c. c.

Case III. Mrs. G. S., aged 26. Seen November 13, 1907, with history of severe "cold" of two months' duration, with thick yellow nasal discharge dropping chiefly into throat. Suction showed a long thick string of muco-pus coming down into right choana. The nose was very narrow, and it was necessary to remove the entire middle turbinate body on the right side. The pus draining from the posterior ethmoids and the sphenoidal sinus was so virulent following the operation that a pharyngitis and tonsillitis resulted. The discharge slowly lessened, but a relapse or fresh attack occurred January 1, 1908, with severe temporal headache, relieved by flow of pus, following shrinking of the tissues with cocaine and suprarenalin. January 18, 1909, removed walls of posterior ethmoidal cells near sphenoidal orifice and irrigated the sphenoid, which contained pus. One week later removed the anterior sphenoidal

wall about the ostium, together with the adjoining ethmoid cells, followed by drainage of bloody yellow and occasionally thick greenish pus. Three weeks later as secretion continued in spite of surgical drainage, vaccine was administered in dose of five hundred million per c. c., the organism being *staphylococcus aureus*. Some depression was experienced during the remainder of the day, but felt unusually well the next two days. There was no headache and the secretion was thinner and less in amount. Eight days later a second injection of 1 c. c. was given and the discharge which had resisted all treatment for three months, and which had endured for five months, altogether ceased, almost suddenly after the second injection, showing only a slight trace when examined two weeks after first injection and two weeks later cultures and smears showed no pus cells or bacteria.

Case IV. Miss A. K., aged 22. Examined February 24, 1908. Gave history of having had severe nasal discharge with thick crusts and post-nasal dropping, as long as she could remember. No headache, but had at one time an abscess of left ear. Examination showed large green-yellow crusts on septum and covering extensively atrophied turbinals in the left nose. Suction brought forth thick dark stringy secretion into the left middle meatus. There was a spur on the right side of the septum and the atrophy was confined chiefly to the inferior turbinal. Cleansing treatment for two days and another suction examination showed pus only in the left nose. February 29, 1908: 1 c. c. of an auto-vaccine showing *staphylococcus albus* was injected. Four days later some improvement was noted, especially in the subsidence of a cough which had been very persistent and most of the secretion was blown from the nose instead of draining backward into the throat. This improvement, however, may as well be credited to the cleansing treatment as to the vaccine, although the rapid relief of the cough was unusual, unless we credit it to the vaccine. Improvement continued for six weeks when the patient failed to return. Operation for drainage of the sinuses was refused in this case.

Case V. Mrs. M. P., aged 52 years. Eyes examined January 17, 1906, on account of a conjunctivitis and difficulty in opening eyelids. The nose showed polypi protruding from the middle meati and bathed in thin, yellowish-white secretion. These were removed, and the anterior ethmoid cells thoroughly cut away. Pus was found on irrigation in the right frontal and maxillary cells. As focal treatment proved insufficient the antrum was opened by removal of a large portion of the nasal wall and the antrum rapidly

ceased to secrete. The frontal sinus, however, in spite of a very patent duct continued to secrete. The nasal treatment of the right nose began September 25, 1906, and had been continued at intervals until April 6, 1908, when a vaccine showing staphylococcus aureus and albus was administered and continued twice weekly for two months, when, in spite of treatment an acute sinusitis developed, and with it a bronchitis and laryngitis, with re-infection of all the cells involved together, with the ethmoids of the other side of the nose. She is now trying a more favorable climate.

Case VI. Mrs. H. D. R. had been under treatment for six months for an iritis of the left eye, when she came to consult my associate, Dr. Frank Allport, who referred her to me for a nasal examination. The nasal infection was found in the corresponding anterior ethmoid cells, which were removed, together with half of the middle turbinal on February 26, 1908. No secretion was found in the antrum or frontal sinus. Four weeks later as the discharge remained about the same in quantity and character in spite of suction drainage, a vaccine was made showing staphylococcus albus and given twice weekly. One week later the secretion was very much less and patient was much improved generally, and the eye showed great improvement. However, at this time she disappeared and further observations were impossible.

Case VII. Miss A. I. was reported upon by Dr. Frank Allport for an acute mastoiditis, with staphylococcus as the infecting organism. As the wound was very slow in healing and indeed had not entirely healed six months later, a culture was made which showed a mixed infection of staphylococci, diplococci and short bacilli unidentified. From this a vaccine was made which brought about complete healing in three weeks.

Case VIII. Miss M. P., aged 15 years, came June 9, 1908. Gave history of frontal headache for two years, difficult nasal breathing and copious, thick, yellow and green nasal discharge. Pansinuitis with polypi. In the right nose the polypi were removed, the anterior third of the middle turbinal resected, and part of the nasal wall of the antrum was removed. In the left nose the anterior ethmoidal cells were curetted, the polypi removed and part of the nasal wall of the antrum removed. Drainage was maintained by means of the suction pump, irrigation of the sinuses, cautery to the granulation tissue about the operative openings, etc. The discharge lessened gradually. October 23, 1908, 0.25 c. c. of an auto-vaccine of 500,000,000 per c. c. was injected. A second injection was given five days later, at which time no secretion was seen in the nose or

sinuses. The vaccine was continued. November 17, 1908, patient acquired an acute rhinitis, which lighted up the old condition for a time, necessitating secondary operations on each nasal antrum wall. Went to California, and on May 18, 1909, when re-examined, showed some thin yellow-green secretion in the antra and tenderness about the frontal sinuses. She had suffered frequently from frontal headaches during the California trip, but refused to consider an external operation, preferring to use the water-power suction pump indefinitely.

Case IX. Miss P. H., aged 16 years, came October 26, 1908, with a history of "catarrh" with excessive nasal discharge of bad odor for one year. Practically every accessory sinus of both sides except the right antrum, was discharging pus, which had produced extensive atrophy and crust formation. The fronto-nasal ducts were exposed by removal of the middle turbinal tips and the anterior ethmoid cells curetted and suction and irrigation of the various cells continued to aid drainage. November 20, 1908, 0.5 c. c. of an auto-vaccine containing 500,000,000 staphylococci was injected, causing a local swelling. The vaccine was increased every seventh day until 1.5 c. c. were given. This amount the patient said caused a fever and queer sensations in her head, beginning 6-8 hours after the injection. The arm remained somewhat sore and swollen for two days. Patient went to Colorado school and had vaccine continued for six weeks with suction. August 6, 1909, reported for re-examination and was found to be much improved. The turbinals were larger and the crusts few and small. A second course of vaccine was given, which also produced local swelling of the arm.

Case X. Miss E. S., aged 27 years. Gave a history of "catarrh" and ear-gatherings during childhood. Two years ago began to have severe "colds." A particularly severe attack began one year ago, with copious yellow discharge with pronounced odor. Treatment by her physician at that time consisted in cauterizing the terminals. When seen first on October 25, 1909, it was found that the left frontal sinus and anterior ethmoidal cells were infected. There was tenderness to pressure on the frontal floor and at the inner orbital angle. Puncture and irrigation of the left antrum of Highmore revealed much yellow pus with marked odor. At the next visit, November 5, 1909, the anterior half of the left middle turbinal was resected and the walls of the bulla ethmoidalis cut away. The constant left frontal headache was relieved by suction and irrigation of the bulla. Irrigation of the antrum and frontal sinus was

also continued daily, following which suction showed very little secretion from the ethmoids. The sinus secretion was considerably less after ten days of daily irrigations, but as the patient lived in a neighboring state removal of the nasal wall of the antrum was advised. A vaccine specimen was taken November 20, 1909, and the first dose was given November 26, 1909, and consisted of three hundred million of a mixed culture of staphylococcus albus and a few grams negative bacilli. The following day there was no appreciable antrum secretion and less than usual in the frontal sinus. The arm where the vaccine was injected was tender and there was slight general depression. Four days later a dose of 600,000,000 was given, which was followed by increased local tenderness and swelling at the site of the injection, and the depression was greater than before. The vaccine was given every fourth day until December 15, 1909, nineteen days after the first injection, when no more secretion was found. The patient was discharged and her family physician advised to administer the vaccine once weekly for four injections. This case is, of course, not conclusively in favor of the vaccine, as we have all seen similar cases clear up under irrigation alone, yet we must admit that the rapid healing of a case with a history of a chronic discharge was at least very unusual.

72 East Madison Street.

Hexamethylenamin in Otitis, W. M. BARTON, *Jour. A. M. A.*,
March 12, 1910.

WILFRED M. BARTON reports a case in which he administered as an experiment 15 grains of urotropin in divided doses internally, to see what effect it would have on the discharge of an acute otitis media. The results as regards the therapeutic effects were good, the discharge being immediately lessened and ceasing after a repetition of the treatment. The point he specially makes, however, is that a decided reaction of hexamethylenamin was obtained from the ear discharge, showing its elimination by the aural mucosa. Whether all cases of purulent middle ear disease will be equally benefited is, of course, unsettled.

**A REPORT OF A CASE OF TUBERCULOUS MENINGITIS
FOLLOWING PURULENT OTITIS MEDIA AND
COMPLICATED BY ANTERIOR POLIO-
MYELITIS AND MEASLES.***

BY WENDELL C. PHILLIPS, M. D., NEW YORK.

B. K., the subject of this sketch, aged 22 months, of Russian parentage, had suffered from purulent otitis media in the right ear for three and one-half months at the time she was brought to the New York Post-Graduate Hospital, October 11, 1909. The mother stated that about eight weeks previously the child had suffered from an acute fever, on account of which she had been admitted to Zion Hospital where she remained for two weeks. Upon leaving the hospital, it was noted that she was unable to walk or stand. There had been no history of tenderness or swelling about the mastoid process until four days previous to her appearance at my clinic, when a swelling appeared in front and above the right ear. The discharge had a fetid odor and had become more profuse. She also complained of pain in the head, and had been sleepless.

She was admitted to the hospital, where a general examination was made. Her weight was 24 pounds, temperature 100° , pulse 120 and respiration 36; throat culture negative; urinary examination revealed faint trace of albumin, occasional pus and excess of indican. Blood examination showed: Red cells, 4,400,000; leucocytes, 15,000, polynuclears, 65 per cent. The pus was thin, yellowish and profuse. There were several scabs on the face, chin and right leg, and two scars from abscesses in the left gluteal region. There was marked bulging of the left abdominal wall.

Dr. H. D. Chapin, who made the physical examination, obtained a clear history of anterior polio-myelitis. A simple mastoid operation was performed. There was extensive necrosis and much foul pus and detritus. The inner table covering the knee of the lateral sinus was necrosed, and was carefully removed.

During the month subsequent to the operation there was no apparent improvement in the anterior polio-myelitis, the paralysis did not improve, the mastoid wound remained foul, and there was a constant discharge of pus from the external auditory canal. On November 15 she developed measles and was sent to the King's County Hospital. She was returned to the Babies' Ward of the Post-Graduate Hospital on December 21.

Upon re-admission her temperature was 98° , pulse 132 and respiration 28. Her mastoid wound had not healed and the granulations were flabby, there was a profuse discharge of foul

*Read at the meeting of the American Otological Society, Washington, D. C., May 4, 1910.

pus, both from the mastoid wound and the external auditory canal. She now had a right-side facial paralysis, her skin was yellow; she had almost constant cough and she was semi-comatose. Each afternoon there was a moderate rise in temperature, but never above 101°. At that time it was the writer's opinion that the child was a victim of tuberculosis, which had extended to the meninges.

On November 24, a radical mastoid operation was performed. Since the previous operation the necrosis had extended in all directions, but especially had the antrum and attic tegmen become soft. Upon removing the necrosed internal cranial table from the middle cerebral fossa it was observed that the dura was of a dull red color, and covered with small whitish specks, which appeared to be miliary tubercles, which were considered confirmatory of the diagnosis of tubercular meningitis.

The round window was found open and pus was seen to exude through the opening. At this stage of the operation the child's condition became so alarming that I was obliged to finish the excavating without delay. This was done and three or four small incisions were made in the dura for the purpose of drainage. A lumbar puncture was now made, both for the purpose of relieving the intracranial pressure and to obtain a laboratory report of the fluid. The fluid came away under pressure but was clear.

The laboratory report upon a smear of secretion from the wound showed rare intra-cellular diplococci. A culture from the same secretion gave streptococci and a few staphylococci. The report upon the examination of the cerebrospinal fluid showed tubercular bacilli, but no other organisms, pus or blood.

On the following day the child was somewhat brighter and more inclined to take nourishment. The temperature reached 102° F. From this time, however, she gradually failed and died from exhaustion on December 31. The temperature did not rise above 102° at any time subsequent to the second operation. The points of interest are: 1, The characteristic appearance of the dura, showing miliary tubercles; 2, Confirmation of the tubercular condition by the finding of tubercle bacilli in the cerebrospinal fluid; 3, It was the writer's first case of purulent otitis media complicated by anterior polio-myelitis; 4, The combination of purulent otitis media, tubercular meningitis, anterior polio-myelitis and measles is a rare occurrence; 5, At no time was there a high temperature except at the beginning of the attack of measles, when it reached 104°.

40 West Forty-seventh Street.

AN INSTRUMENT FOR DIRECT INTUBATION OF THE LARYNX.*

BY HARRIS PEYTON MOSHER, M. D., BOSTON.

In THE LARYNGOSCOPE of October, 1909, I published a preliminary account of a case in which direct intubation was employed. The instrument was not described because I wished to test it further. Since the preliminary report the instrument has been used on one case some six times. It has also been successfully tried on one adult. Dr. Clark, one of my superiors at the hospital, has tried it for extracting a tube. The child, a little girl, 5 years old, upon whom I have used the instrument, permitted direct intubation and extubation the last three times without ether. On these occasions the pharynx was anesthetized by 10 per cent cocaine and by the promise of a 10 cent reward. The combination worked



Figure 1.

Forceps for Direct Intubation. The forceps is shown with the extractor in place.

very nicely. On the adult 20 per cent cocaine solution was used. These two cases show that the procedure does not necessitate the use of ether.

The instrument is built on the plan of a pair of alligator forceps. In fact a pair of these forceps can be used for the manipulation if nothing else is at hand. My instrument is best described as a pair of alligator forceps, the lower blade of which is broadened out into the shape of a cup, whereas the upper movable blade is extended into an obturator. Figure 1.

*Read before the American Laryngological Association, Washington, D. C. May, 1910.

The upper blade acts as an obturator for introduction and as an extractor. Three obturators screw into the base of the upper blade, and these three obturators fit all sizes of tubes, from the smallest tube for the infant to the largest adult tube. Each obturator has a joint in the middle which allows the lower half to tilt upward during its withdrawal. Figures 2, 3 and 4.



Figure 2.

Cut to show the joint in the obturator which allows it to be withdrawn without binding.



Figure 3.

The cut shows the manner in which the forceps hold the intubation tube.



Figure 4.

Cut shows a small tube in the forceps. In order to reduce the number of obturators, with the smaller tubes, the obturator is allowed to project beyond the tube.



Figure 5.

Cut to show how the tube can be raised to facilitate its introduction.

The tube is introduced with the patient on the back and with the head over the end of the table. In this position, when the tube is in the larynx it naturally tilts a little upward. Owing to this, I found that unless the obturator had a joint it was liable to bend on the way out. Further I found that in direct intubation under cocaine, often only the posterior half of the larynx is seen. This makes it necessary to point the end of the tube slightly up-

ward. This is easily done because the tube can be tilted to any angle by spreading the handles of the forceps. Figure 5. Even in direct intubation it is better to thread the tube as in indirect intubation, for it is perfectly possible, as I can say from one humiliating experience, to intube the esophagus.

It is not necessary to use the three special obturators except in cases in which there is danger of the tube becoming blocked during the introduction. In papilloma of the larynx such a danger exists. Therefore, it is necessary to use them in such cases. It is better, also, to use the special obturators in cases of inflammatory narrowing of the larynx. In the adult whom I intubed, the lesion was of this class. In the child, however, I was



Figure 6.
The author's open speculum.



Figure 7.

Figure to show the manner of using the open speculum. The edge of the speculum rests on the tooth-plate.

dealing with post-diphtheritic adhesions between the cords. In this case I found that the extractor, which is simply the smallest obturator without the joint, could be used both to insert the tube and to extract it. Even in such cases, at the first introduction of the tube, which I imagine will generally be done under ether, it is better to use the obturator. After this, the tube has made a channel for itself and the special obturator is no longer required. Figures 6, 7 and 8.

With small tubes, intubation and extubation can be performed through the Jackson speculum. Extraction can always be done through this instrument, if the tube and speculum are withdrawn together. To this, of course, there is no objection. When, how-

ever, large tubes are to be inserted the writer's open speculum is essential. I am somewhat used to the open speculum and so employ it in all cases. The open specula as they were first made were too large and there were too many of them. I now use three sizes, two sizes for children and one for the adult.

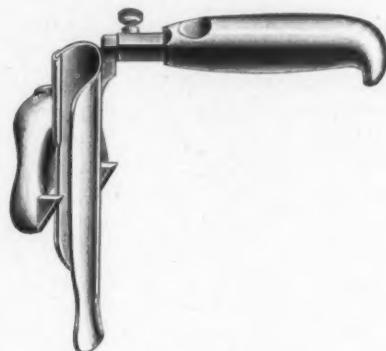


Figure 8.

Cut to show the method of using the open speculum. The manner in which this speculum gets its leverage on the tooth-plate is shown. The caps on the tooth-plate act as a gag to keep the teeth apart.

The set for direct intubation consists of the tooth plate, the open speculum and the intubation forceps with three obturators and one extractor.

828 Beacon Street.

Bronchial Vincent's Angina. J. H. ROTHWELL, *Jour. A. M. A.*,
June 4, 1910.

J. H. ROTHWELL reports two cases of bronchial affection following pneumonia in which the bloody sputum was full of Vincent's spirilli, which indicates to him that this infection may sometimes attack the bronchial mucosa without showing itself in the pharynx or throat or tonsils. He has not seen such reported so far. He has also had another similar case, and mentions still another in the practice of another physician.

DIRECT LARYNGO-TRACHEO-BRONCOSCOPY, AND ESOPHAGOSCOPY; REPORT OF CASES.

BY L. J. GOLDBACH, M. D., BALTIMORE, MD.

It is without question that direct laryngo-tracheo-bronchoscopy is daily broadening its scope of usefulness; it is only a matter of time when this method will receive the credit it so richly deserves, and partly revolutionize the present status of treating these special organs. For an ordinary laryngoscopic examination the indirect or mirror method answers well, but when a thorough examination is desired of a pathological condition existing within the air tubes, the direct method, is the method of choice. With the tubes we have a direct view, and not an inverted image as with the mirror; we have the patient under better control, and it matters little how skilled we are with the mirror, we never have that certainty of precision and exactness that we have to such a nicety with the tubes.

To make a direct laryngeal examination seldom requires a general anesthetic except in children or nervous and hysterical individuals. With a curved applicator the pharyngeal wall is brushed with cotton dipped in a 20 per cent solution of freshly prepared cocaine. After a moment's pause, the laryngoscope is introduced, and the base of the tongue and the epiglottis are brought into view. This is cocaineized as well as the sub-glottic space. Allowing a few minutes to intervene, the laryngoscope is removed. On its reinsertion, the base of the tongue and the epiglottis are pushed forward; this brings into view the internal structure of the larynx, and a complete and satisfactory view can be obtained after its thorough cocaineization. It is rather a good custom to give the patient $\frac{1}{4}$ grain of morphia and $\frac{1}{150}$ grain of atropia hypodermically 30 minutes before the examination.

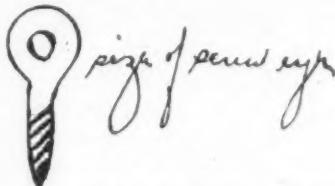
Case 1. Woman, aged 28, entered the Presbyterian Hospital complaining of hoarseness and loss of voice. The laryngeal mirror revealed singers nodes. The first operation was by means of the indirect method; did not succeed in removing them entirely, owing to the location of one under the left cord posteriorly. By the direct method this was satisfactorily removed.

When examining the trachea, the tracheoscope is inserted through the laryngoscope, and the latter removed. As the tracheoscope is cautiously pushed down, we cocaineize; it is rather surprising to note how little of the cocaine solution is used.

Case 2. Girl, aged 18, complained of a raw spot in the throat. By asking her to locate the spot, she would place her finger about 2 inches below the thyroid cartilage. On tracheoscopic examination a small ulcer was seen and the trachea inflamed. When the ulcer was touched, she immediately said, "that is the spot." A few applications of a 5 per cent solution of nitrate of silver gave her great comfort. Incidentally she remarked, "I am tired taking cough-medicines, as I have almost consumed a barrel of it." The bronchoscope can very readily be introduced, when we have finished with the tracheoscope.

Case 3. A woman, aged 42, complained of constant coughing with no expectoration. On broncoscopical examination no marked pathological condition was seen, except a slight red and edematous bronchus. A 2 per cent solution of nitrate of silver was used down to its division. Happily in her case the result was very good.

With esophagoscopy, we use the same methods; at times it is better to use the index finger as your guide in enabling the tube to pass by the pyriform sinus.



Case 4. Mrs. C., complained of having swallowed a false tooth. She said that she felt it every time she swallowed. Asked to locate it, she placed her finger about 2 inches below the thyroid cartilage. After cocainization of the passages, the esophagoscope was slowly introduced. No tooth was found, but the posterior surface of the esophagus was lacerated for about 3 inches. She was a rather hysterical woman, and after a week returned again complaining. On examination, nothing was found, and the laceration had entirely disappeared. An X-ray examination gave negative results.

Dr. R. H. Johnston has an ingenious method that he styles his "straight flexed position," in which after the laryngoscope is introduced, the head is gently flexed forward and to the lateral side; the chin coming very close to the chest. By this means, an extremely satisfactory view of the larynx can be obtained, and ideally situated for operation under a general anesthetic. By this method the tiring of the hand, and having the patient's head hanging over the table is avoided. Those who have used the laryngoscope un-

der a general anesthetic readily appreciate how difficult it is to hold the base of the tongue forward; those who have used this position, readily realize its advantages. Since writing the above, I was called to remove a screw that was lodged in the throat of a colored boy, 7 years of age. After a preliminary examination with the mirror, I advised chloroform anesthesia. The larynx and the base of the tongue was brushed with a 10 per cent solution of cocaine. When the laryngoscope was introduced, the screw could be seen at the extreme anterior end of the cords, the point of the screw facing. With a Jackson forceps, the point of the screw was caught and dislodged. After its removal it was found to be a screw eye. The first introduction of the tube was unsuccessful owing to the large amount of mucus and secretion. After the hypodermic injection of 1/150 of atropia, a better view of the larynx and trachea could be obtained.

322 N. Charles Street.

Miner's Nystagmus. T. H. BUTLER, *Brit. Med. Jour.*, March 5, 1910.

Butler points out that nystagmus is especially the disease of the collier; that other employees working under similar conditions are not subject to it. He therefore agrees with Reid and Nuel that it is caused by a disordered cerebration; a defect in the brain not of the eye-muscle. The long-continued rhythmic movements of the pick, which the miner makes in comparative darkness, produce it. A miner who has once suffered from nystagmus must never again return to underground work. Many patients recover completely in time.—ED.

ROUTINE USE OF LIGATION IN TONSILLAR BLEEDING WITH DESCRIPTION OF TECHNIC.*

BY LEE COHEN, M. D., BALTIMORE.

Although the ligation of vessels to control hemorrhage has been regularly practiced in all general surgical operations since 1545, when Ambroise Pare demonstrated its indispensability, this procedure has not been adopted to arrest hemorrhage following removal of the faucial tonsils. In fact, until a short time ago, rhinopharyngologists as a whole have placed their faith in such insecure methods as astringent applications, use of ice, prolonged pressure—either digital or with clamp-cauterization of the bleeding area, etc. Even to-day these measures are relied upon exclusively by many. More recently, suturing of the faucial pillars over a pad of gauze and torsion of the bleeding points have been advocated by some, in case of failure of above-mentioned procedures, and in a few reported instances, as a last resort, the external or common carotid artery has been ligated.

Evidence, however, that these methods of controlling bleeding have often proven insufficient may be found in the tabulated report of Harmon Smith,¹ who collected 54 cases of alarming hemorrhage from the literature between 1868 and 1904. Six of these cases ended fatally; and no doubt if all severe hemorrhages and fatalities found their way into the literature, the number tabulated by this observer would be found to represent but a very small proportion of those actually occurring.

The recent excellent collective investigation by Dr. Richards,² relating the experiences of many of the leaders in our special work as to severe hemorrhage following tonsil operations, bears further testimony that some *secure* means of arresting primary hemorrhage and the prevention of its recurrence secondarily should be adopted in these throat operations.

It may with truth be said that the throat men fail to receive the desired recognition as surgeons from their confrères, the general surgeons, whose aid many have been forced to ask in controlling severe bleeding after partial or complete extirpation of the tonsils. This is due largely to the employment of the above-mentioned unsurgical methods.

*Read before the Eastern Panhandle Medical Society, Charlestown, W. Va.

I learned but recently of two patients in our city who, several hours after tonsillectomy, having begun to bleed profusely, were subjected to digital pressure with gauze sponges for 4 or 5 hours, a procedure not only most irksome to the physician, but accompanied with great pain and discomfort to the patient, to say nothing of a greatly protracted convalescence due to the loss of blood, to the trauma induced by the pressure and the infection likely to follow such manipulation. Such occurrences, lamentably frequent as they are, can but reflect discredit upon throat work as a whole. As an instance, I would mention the view of one of our most prominent local surgeons, who requires a tonsillectomy, owing to some troublesome rheumatic symptoms. Upon being asked recently, by a colleague why he hesitated to have this operation performed, he replied, "Oh, I'm afraid of these throat fellows, because they never tie any bleeding vessels."

In a series of questions asked by a number of our leading specialists in November, 1908, out of 36 replies to the question: "By what method do you control bleeding?" only 9 mentioned the use of the hemostatic forceps. Of these nine, 6 referred to their use for the purpose of torsion only, whereas 3 ligated vessels in severe cases when they were able to reach same. These replies would indicate that the ligature was not at this recent time looked upon as a generally feasible means of controlling hemorrhage from this source, but rather a method for use in an extreme case, perhaps, when its application was possible.

In a monograph read before the Atlantic City meeting of the A. M. A.,³ in June, 1909, the routine use of the ligature to control post-operative tonsillar hemorrhage was proposed by the essayist, not only to prevent severe bleeding but to reduce any loss of blood to a minimum.

Another year's experience has so strengthened my belief in the value of the ligature as a routine measure, that I do not hesitate to offer the opinion, that in almost every tonsillectomy, even when comparatively little blood is lost, such loss could be still further reduced by tying the bleeding vessels, whether they be large or small. This statement is made with a full realization that many of my colleagues, who still maintain that pressure and torsion suffice, are not in sympathy with such views. When we consider on the one hand, however, that almost all patients operated upon under general anesthesia, repeatedly vomit some blood after being returned to bed, when the vessels are not tied—an evidence of continued ooz-

ing—whereas, on the other hand, this vomiting is but seldom seen after employment of the ligature, there should be no doubt as to the efficacy of the procedure.

It has been said that ligation of vessels in the throat is not only unnecessary in many instances, but that the presence of a foreign substance (the cat-gut) can only hinder the healing process. That the ligature might be omitted at times cannot be denied, but why a foreign substance such as a ligature should be looked upon as harmful in the throat, where healing is always by secondary intention, when it is accepted without reservation in such delicate regions as the abdominal and cerebral cavities, where primary healing must perforce occur, I fail to comprehend.

Though a number of men have adopted the ligature in tonsil operations during the past year, with much satisfaction, dissenting voices evidence the fact that still more missionary work is needed to make its use for this purpose, general. Also in discussing the subject of ligation within the throat, some men, while acknowledging the merit of the procedure, emphasize the difficulty in its application. Dr. Richards, in the monograph before mentioned, says, "If simple pressure is insufficient, the bleeding point can be grasped with the tonsil hemostat and the vessel twisted or tied. Tying the vessel is *very difficult* and will seldom be necessary." All things worth doing are difficult until the technic is mastered, and you may feel assured that after this is accomplished by repeated practice, the tying of a vessel in the tonsillar fossa will be found less difficult than in some other parts of the body—for example, in the vagina when doing a vaginal hysterectomy, or in the pelvis, through a small abdominal wound. At the present writing I am constantly ligating vessels and no longer experience the least difficulty. Others, who have adopted the ligature, bear me out in this assertion.

Since the presentation of my former paper, many inquiries have been made as to the details of the method employed, and this, gentlemen, is my reason, for again discussing the merit of this important measure. Perhaps the following detailed technic, along with the illustrations so ably made, may furnish some aid to those desiring to develop the use of the ligature in routine work.

METHOD: As to the technic, I would first say, that all tonsils requiring extirpation, whether the subject be young or old, are completely removed in their capsule with knife and vulsellum. Further, that when operating under ether, the patient lies in the dorsal-prone position, with the head lower than the feet, thus dimin-

ishing any liability to aspirate blood. By having the anesthetizer extend the head of the patient thoroughly, the tonsillar fossae are much more accessible.

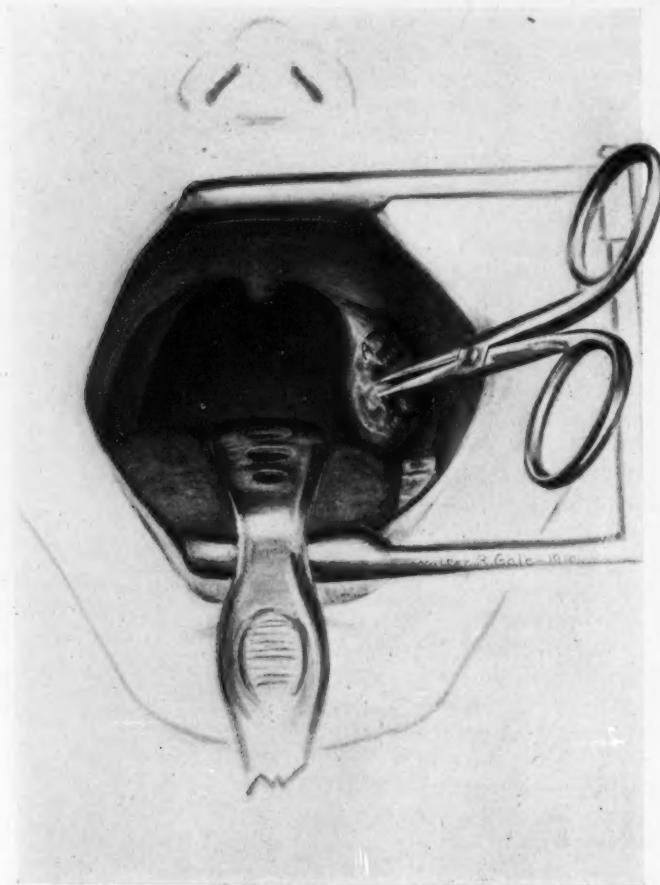


Figure 1. The tonsil pulled forward over the anterior pillar to control bleeding while completing the excision from behind forward.

When operating under cocaine, the patient sits erect in an operating chair until the process of tying vessels begins, when, experience has taught us, that by lowering the back of the chair and thus placing the patient in almost a prone position, the field can be better

seen, the patient is under better control, and the vessels may be caught and tied with greater ease. Under both general and local anesthesia, cat-gut only (No. 2 or No. 3) is employed for ligatures. The operator should have one assistant, besides the anesthetist, and a nurse who rapidly supplies the sponges and handles the instruments. It goes without saying, therefore, that this operation should always be performed in a well-equipped hospital.

In beginning the dissection between the anterior faucial pillar and the tonsil, after the gland is pretty well separated below under the plica tonsillaris, and above in the supra-tonsillar fossa, it is a common experience to encounter a spurting vessel about the middle of the fossa where the tonsillar artery usually enters the gland. Bleeding at this point is often so great as to obscure the field and render further progress difficult. Should such bleeding occur, the ligature may be applied at once, before completing the excision; or, in order to save time, it has been my custom to pull the partially liberated tonsil somewhat forcibly forward over the anterior pillar, making pressure outward at the same time, thereby effectually stilling the hemorrhage and also bringing the attachment of the posterior pillar to the gland prominently into view, as shown in Figure 1. By this manipulation, the attachment of the posterior pillar may be severed and the enucleation rapidly completed, working forward from the rear.

The tonsil having been removed from the fossa, blood may well up so profusely that it would seem almost impossible to see or catch a bleeding point. This fact has been emphasized as one of the obstacles in the use of the ligature, and this apparently almost insurmountable difficulty is easily overcome, if the fossa is quickly packed with 3 or 4 small gauze sponges held in *eight inch* Kelly clamps, instead of using one large gauze sponge as has been the usual custom. Then, by the removal of one sponge after the other, beginning from below, each section of the fossa may be inspected separately, the bleeding points located and tied successively, while the hemorrhage from any other part, which would doubtless obscure the field, is controlled by the sponges not yet removed.

Another great stumbling block in the beginning of this work is the difficulty, after the vessel is caught with the hemostat, in slipping the ligature from the end of the forceps over the tissue engaged. The cause of this trouble seems obvious when we consider the depth of the cavity in which we work and the small space between the teeth in which we have to bend over or "rock" the

hemostat. Besides, the tendency in most instances, is to catch a full, frank and deep bite with the forceps into the comparatively inelastic tissue, which absolutely precludes the gliding of the cat-gut from the clamp onto this tissue. To overcome this last mentioned obstacle, it will be found best to use only a broad flat artery



Figure 2. Manner in which assistant holds hemostat; also the hands of operator when in the act of pushing cat-gut loop over tissue to be tied.

forceps like that originated by Chevalier Jackson of Pittsburg. By referring to figure No. 3, a sectional view of the throat, it may be seen that our method is to engage but a portion of the broad end of the hemostat, taking a lateral bite, as it were. This leaves one edge of the forceps free so that the cat-gut loop may glide easily under it during the process of tightening. Another decided advan-

tage of the broad hemostat is that it does not cut into or impair the nutrition of the tissue, when a non-bleeding point is caught and liberated.

After thus engaging the forceps, an assistant holds them in the manner indicated in figure 2, while the operator, with a piece of cat-gut about 18 inches long loosely ties a single loop about the shank of the hemostat. One end of the cat-gut is held within the last three fingers of the right hand, leaving the thumb and index-finger free to grasp the shank of the artery clamp below the assistant's hand; the other end of the cat-gut is held in the same manner by the left hand, leaving the index-finger free to push the loop downward. When the loop reaches the end of the instrument, the right hand bends or "rocks" the forceps, lifting them lightly at the same time; simultaneously the left index-finger pushes the loop under the disengaged edge of the instrument. By holding the forceps thus, the operator recognizes by the sense of touch, unaided by the eye, the moment the loop slips from the end of the instrument on the tissue to be tied. After tightening the loop, the assistant is directed to liberate and remove the hemostat. Tying is then completed by a triple knot. In a similar manner, the other bleeding points are sought and tied. A frequent cause of failure is that, while tying the knot, the left index-finger does not hold the loop tightly against the part engaged so that when tension is exerted on the cat-gut with the right hand, the loop is torn off.

It will at times be found an advantage to make use of two pairs of artery forceps in locating a bleeding point, as indicated in figure 3 (D and E). This is especially true, when the bleeding comes from the loose tissue down near the tongue. By lifting this tissue with one pair of forceps, the bleeding vessel is brought plainly into view and can readily be grasped by the second pair.

It should always be borne in mind that the angles of the mouth are elastic and can be stretched downward to a very great extent. The depth which can then be reached with an index-finger of average length, in tying a vessel within the throat, is truly surprising. Only on two occasions, during the past year, in the presence of extreme dolichocephalia, has it been impossible for me to apply the ligature with the index-finger, unaided. In both of these instances, after the loop was pushed into the throat as far as possible, the tying was completed by grasping the cat-gut with a Kelly clamp.

Presuming that the operator stands to the right of his patient, the left index-finger will reach with ease all parts of both fossae,

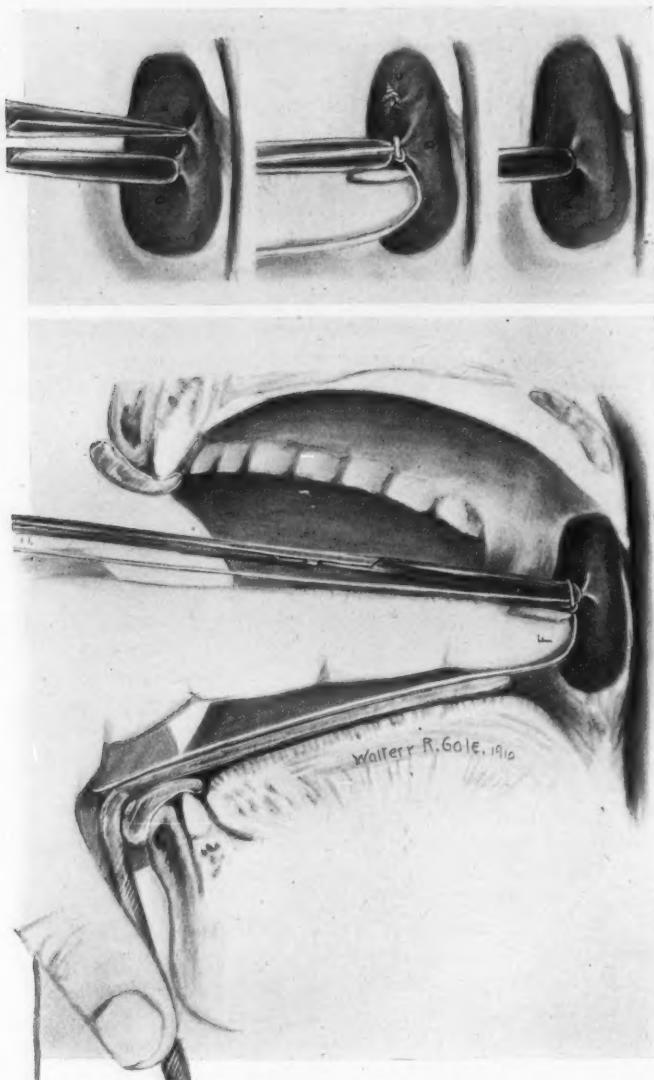


Figure 3. A. Hemostat engaged, one edge being free so that ligature slips under it easily. B. Position of finger in the act of tightening loop. C. One ligature, in situ. D and E. Two hemostatic forceps engaged. F. Lateral section of throat showing relative position of index-finger in pushing the loop off of forceps and how the cat-gut is held with last three fingers of left hand.

excepting deep in the right fossa near the base of the tongue. In this situation only, I find it better to stand directly at the head of the table, from which point, by depressing the left angle of the mouth as much as possible, we can readily reach under the right anterior pillar which stands in our way when tying from the right side.

In the supra-tonsillar fossa, the bleeding point is often concealed under the angle formed by the junction of the faucial pillars. Its exact location is best found by completely everting the pillars with forceps and pillar hook. The pressure exerted during this process is sometimes sufficient to temporarily stop the bleeding. We should not, however, be misled by this apparent stoppage, for by relaxing the tissue somewhat, the bleeding point will again present itself.

A comparison of the results following operation under general and local anesthesia, as regards hemorrhage, is of great interest. Of 173 cases operated upon by me during the fiscal year, 1909, 140 cases, ranging from 2 to 33 years, were done under ether. Of this entire number, not one case of recurrent or secondary bleeding is recorded. Thirty-three were done under cocaine anesthesia, of which there were three cases of active delayed primary bleeding, several hours after operating. These were again removed to the operating room and several vessels easily ligated without even the further use of cocaine. In three others, some hours after being returned to bed, oozing of blood occurred, so slight, however, that pressure with a gauze sponge for a few moments, controlled it. It might be added that in these patients one or more bleeding vessels in each fossa had been tied at the time of operation.

The cocaine cases ranged from 14 to 52 years of age. The ages of those in whom any recurrent bleeding occurred, were 17, 19, 23, 24, 33 and 36 years, respectively.

There can be no doubt that recurrent hemorrhage is more liable to occur when local anesthesia is employed. In the first place, cocaine, by contracting the parts, prevents many vessels from bleeding at the time of operation, but which, when reaction sets in, begin to bleed profusely. Under ether all vessels severed show at once any tendency to bleed and can be ligated immediately. For this reason I am to-day more inclined than ever to perform as few of these operations as possible under cocaine anesthesia. In my experience, the age of the patient seems to play but a very small

rôle as a predisposing cause of hemorrhage, if the vessels are routinely tied.

To conclude, though in the majority of cases, ligation may not be an absolute requirement, yet severe bleeding occurs often enough to warrant the assertion that we should always have at hand a certain and reliable method of control. Since the ligature is recognized as the only absolutely secure surgical means of arresting hemorrhage, it should be generally adopted in throat surgery.

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1622 Madison Avenue.

The Truth About Tonsils and Adenoids. J. W. JERVEY, *Jour. A. M. A.*, May 14, 1910.

J. W. JERVEY argues for the normal function of the tonsils, the swelling of which he considers to be often purely a compensatory hypertrophy. The majority of cases of recurrence of quinsy he has observed, have been with the so-called submerged and ragged tonsils. These call for operation, which, however, he thinks, is too frequently done in case of the swollen or protruding tonsils which often cause no trouble. In the case of adenoids also, he says a small growth in Rosenmüller's fossa is more potent for mischief than a much larger one in the vault or posterior pharyngeal wall not causing obstruction or irritation. In the absence of the latter he never removes a growth in the vault or posterior wall but he always sees that the fossae are clear. If the tonsils were always as bad as some seem to think they ought to have disappeared in the course of evolution by this time.

SOME PRACTICAL POINTS IN THE TOTAL EXTRIPATION OF THE TONSILS FROM THE EXPERIENCE OF FIVE HUNDRED CASES.*

BY WM. B. CHAMBERLIN, M. D., CLEVELAND.

The tonsillotome, long so conspicuous in the armamentarium of every rhinologist, like many another instrument which has been supplanted by a better one, seems on the road to partial or complete disuse. In certain selected cases, the tonsillotome is still of value, but the number of such cases grows more and more limited and the opinion seems to prevail, not only in the minds of the profession, but in those of the laity as well, that if tonsils are to be removed at all, they should be removed completely. This change in operative procedure has necessitated not only a complete change in the operative technic, but also in the armamentarium. An operation comparatively simple has been supplanted by one attended with considerable difficulty; so it has seemed to the writer that a presentation of some of the more practical points in the technic of the operation might awaken discussion of a topic, considerably hackneyed, but nevertheless of interest.

Anesthesia: Ether, for well known reasons, seems to be the anesthetic of practically universal choice to-day. I will simply mention the reasons for its use as no discussion seems necessary. First of all, I should place the element of safety, next complete relaxation and lastly ample time in which to operate. My own preference is for the drop method, though in certain cases, difficult to anesthetize completely, I still resort to the cone. The anesthesia should be carried to complete relaxation, as it is difficult to continue the administration during the operation, while, if the patient is not completely under, the frequent gagging may interfere decidedly with a clean and careful dissection. In this connection I should like to call attention to a point of frequent clinical observation, namely, the remarkable toleration of children and even infants to ether—a far greater amount being necessary than one's experience in administering ether to adults would indicate. The amount of ether requisite to anesthetize a six-months' infant is frequently surprising. For local anesthesia pure cocaine moistened in adrenalin possesses

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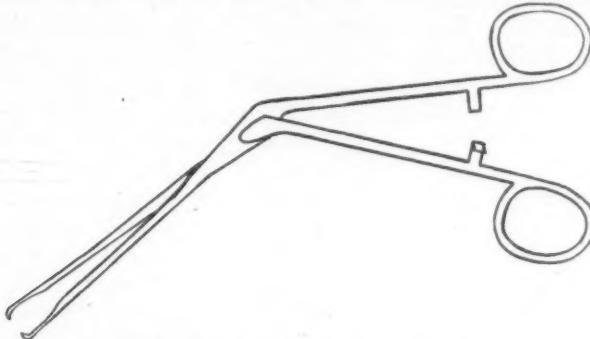
decided advantages. No more cocaine is required for the anesthesia than if a five or twenty per cent solution is used, while the operative field is anesthetized and little or none of the surrounding tissue. The local applications of cocaine are followed by deep injections of one-half per cent cocaine, to the drachm of which, five to ten drops of adrenalin are added.

Position: The positions for operation are three: 1, the patient lying on the back with head vertical; 2, the head to the side, to right or left according to the preference of the operator; 3, the head hanging over the end of the table at an angle of forty-five degrees to the main axis of the body. My own preference is for the last position, and for the following reasons: For the first or second positions, artificial illumination of the field is almost essential, the operator sits or stands in a more or less constrained or awkward position and the field is frequently obscured by blood to a very annoying degree. With the head in the Rose position the relation of the two tonsils to the operator is the same, while a considerable portion of the blood gravitates to the naso-pharynx and escapes through the nose. If the operator sits facing the top of the patient's head, he has at all times a most complete view of the field of operation, is in a comfortable position, and assistant as well as operator have ample opportunity to keep the field clear if bleeding is excessive. Furthermore, no artificial light is necessary, as the field, even on a cloudy day, is abundantly illuminated by the light which falls directly into the mouth over the operator's shoulder. The majority of my operations are performed at homes where gas is not infrequently the sole method of illumination, hence the artificial light would be impossible. The assistant stands on the patient's right, depresses the tongue with depressor held in the left hand, and sponges with the right hand. A second assistant sits on the patient's left and holds the head firmly in the desired position, the left hand being beneath the occiput, the right on the forehead.

There are two principal objections to this position. The first is the number of assistants required—an objection which would seem to spring from pecuniary rather than logical grounds. No operator should attempt to perform a tonsillectomy or even a tonsillotomy who is not capable and prepared to cope with tonsillar hemorrhage. Should this occur, he will certainly find the services of two assistants very valuable. The second objection is, that the relation of the operator to the field of operation is reversed. This, I admit, is more or less awkward at first, but not more so than if the head is turned on the side and one tonsil is operated upon from above, the

other from below. A versatile operator will soon accustom himself to the changed relations, and I firmly believe, will be more than compensated by the many advantages which this position affords.

Armamentarium: The first essential instrument in the operation is a suitable gag. The gag of Whitehead seems an ideal instrument. It is most serviceable without the tongue-depressor attachment. This attachment in certain conformations of the mouth seems absolutely ideal; in others it is completely useless, obstructing the field of operation and forcing the base of the tongue into the pharynx, thereby interfering with free respiration. The advantages of the Whitehead gag are manifold and are possessed to such a degree by no other instrument. It is light, adaptable to any mouth, and does not obscure to the slightest degree the field of the opera-



tion. Furthermore, if the jaws have been completely opened, it always remains fixed in position and no assistant is required to maintain it in place. The tongue-depressor should be broad and not too long. It should have a fenestrum in order to firmly engage the tongue and prevent slipping. The depressor of Sass well satisfies these requirements.

After trying practically all of the tonsil knives on the market I have discarded knives entirely, and though I realize that an excellent tonsil operation can be done with a knife, scissors for most reasons seem preferable. The mucous membrane and connective tissue around the tonsil is tough, loosely connected and very elastic. An incision with a knife can hardly be made without exerting considerable traction, with resulting distortion. Scissors cut clean, leaving the tissue practically *in situ*. The ordinary angular nasal scissors satisfy all requirements, though the scissors of Kirkpatrick

with serrated edges will often be found useful. After the primary incision through the mucous membrane at the middle point of the free border of the anterior pillar, the remainder of the dissection should be blunt as far as possible, scissors occasionally being resorted to when especially resisting tissue is encountered. For this blunt dissection I have found no instrument superior to the double-end submucous elevator of Hajek and Ballenger. The sharp end is as free cutting as any instrument should be for work in this location, while the blunt end will be found sufficiently sharp for most cases. The point of election for the primary incision is best determined by grasping the tonsil firmly with the forceps and making gentle traction forward and inward. There are many good tonsil forceps on the market. My preference is for a modification of the nasal forceps of Fein, which I use as ordinary dissecting forceps would be used in other parts of the body. No tearing can result from their proper use while the angular shaft keeps the hand at all times free from the field of operation. If hemorrhage follows the removal of the tonsil this instrument will be found a ready and effectual hemostat—no other being required. It thus serves a double purpose. When the pedicle of the tonsil is to be snared, the loop of the snare may be passed over the handle of the forcep or the blades may be inserted through the snare loop before the tonsil is grasped.

Under general anesthesia the snare of Marquis is a most serviceable instrument, but for operations under local anesthesia I prefer the snare of Peters. It is a more powerful instrument, can be used with less traction on the tissues, cuts more quickly if speed becomes necessary, and I am sure, causes less pain. For operations under local anesthesia, blunt dissection is hardly advisable on account of the increased pain. Here one is operating in a completely bloodless field and a clean dissection can be made with scissors alone. I have found no scissors so useful for this operation as the serrated scissors of Kirkpatrick. The right and left angles enable one to work in any location or position while the serrations prevent the tissue slipping from the bite of the blades. They also cause less hemorrhage.

As the dissection is carried upward, the extent of the tonsil, especially of the velar lobe, is disclosed by the continued traction of the forceps. A difficult and most important step in the operation is reached when the velar lobe has been freed anteriorly and the dissection is to be carried posteriorly between the tonsil and the posterior pillar. The attachment of the pillar to the posterior corner of the base of the uvula is thin and exceedingly delicate. Cutting of

this attachment will most surely destroy the symmetry of the palatal arch and, if extensive, will lead to unsightly as well as troublesome adhesions and contractures. During this part of the dissection the field should be kept absolutely free from blood and if scissors are used at all they should be used only when the posterior part of the superior pole and capsule are clearly in view. Cutting should at all times be toward the tonsil rather than from it. In this way the injury of the surrounding tissue will be almost completely avoided. After passing the superior pole, the remainder of the posterior dissection is entirely blunt and is extremely easy. It is usually well to nick the inferior attachment of the tonsil with scissors so that the lower part of the snare loop may engage the whole tonsil successfully.

The tonsil is now free, above, below, in front and behind and is attached externally by a very narrow pedicle embracing the lower two-thirds of the external surface. By its own weight, or by very gentle traction, the tonsil should now prolapse almost completely into the mouth. If strong traction is necessary to bring it readily into the snare-loop there can be no surer sign that the preliminary dissection has been incomplete. Strong traction can only result in shredding of the tonsillar tissue and a resulting incomplete operation. The tonsillotome might better have been used in the first place.

The snare seems the preferable instrument for the severing of the pedicle. If the dissection has been properly done the wire follows the line of least resistance, which is immediately external to the capsule. The snare should never be applied unless it can be freely passed external to the greatest diameter of the tonsil. If the wire loop closes *across* the greatest diameter of the tonsil or *internal* to it, the enucleation must be incomplete, whereas if not tightened until the proper position has been reached, the tonsil, with capsule intact, is completely shelled from its bed. Another advantage of the snare is certainly decreased bleeding. I cannot substantiate the contention of Jackson that the snare predisposes to secondary hemorrhage.

Failures and Accidents: The former have been discussed in part in the preceding paragraphs. I believe that one potent cause of trouble is the lack of appreciation of the true depth of the tonsillar capsule below the mucous membrane. My incisions in my first operations along the margin of the pillar were carried far too deep and the capsule was not infrequently lacerated. The primary incision should be a mere nick through the mucous membrane, barely

large enough to admit the end of the dissector. Through this nick, unless the tissue is especially vascular, the white glistening capsule can always be seen. The tonsil operation can best be compared to another operation—simple if done properly, difficult if not. I refer to the removal of a sebaceous cyst of the scalp. If the capsule is not wounded, the cyst pops from its bed almost like the pulp of a grape from its skin under pressure; so with the tonsil. But if the capsule is lacerated, the tonsil tissue invaded and shredded by forceps and scissors, a successful operation may be well-nigh impossible.

Not only should the tonsil be well pedunculated, but the field should be free from blood when the snare is adjusted and tightened, otherwise the uvula or large portions of pillars or both may be engaged and amputated as the snare is closed. The affinity which the uvula shows for the interior of the snare loop is surprising. Pierce advises grasping the tip with forceps and holding it free as the snare is adjusted and tightened. I always resort to this procedure unless the field is so free from blood that I can keep the uvula clearly in view at all times. The amputation of the uvula may not and does not usually cause any difficulty to the patient. Fortunately he rarely knows it. Such an accident, however, does not contribute to an operator's peace of mind at the time or even later. It is a decided jolt to his confidence in his ability.

The possibility of hemorrhage is ever present in any tonsil operation, although the old bugbear of cutting the internal carotid has been fairly well banished. It must be a bungling operator who could successfully accomplish this. The bleeding is usually from the tonsillary artery or from an anomalous blood-vessel along the posterior pillar. I have encountered hemorrhages—some of them fairly severe. I expect to encounter more. Hemorrhage from the tonsillar fossa should be treated like hemorrhage in any other part of the body; the bleeding point should be grasped with forceps and either ligated or crushed. Tonsillar oozing is in my experience a myth. Oozing is simulated because the blood stream strikes the anterior pillar and the fossa is flooded. If bleeding occurs after the tonsil has been removed, a sponge large enough to fill the fossa is pressed tightly into it and held in position by the index finger of the appropriate hand. After a few moments the sponge should be removed. If bleeding follows a few attempts at compression, the pillar should be retracted, the field cleared of blood by sponging and the bleeding point grasped with forceps. The forceps should be left in position a few moments and then removed by torsion. I

have not found it necessary to ligate the bleeding vessel, though ligation has been resorted to by one of the assistants in the clinic on several occasions.

The after-treatment is largely a matter of individual preference. I make no local applications—neither do I advise the use of washes or gargles. I am firmly convinced that the convalescence is much slower after tonsillectomy than after tonsillotomy. Some soreness or even unhealed granulating patches are not unusual at the end of ten days or two weeks.

In closing I should like to repeat the following points mentioned in a previous paper:

1. Tonsillotomy may give relief in certain cases, but tonsillectomy affords the surest promise of cure.
2. There is no greater danger of hemorrhage in tonsillectomy than in tonsillotomy. There is always a danger of hemorrhage in any tonsil operation.
3. Any method is a good one, so long as it aims at complete removal. The choice of method is a matter of individual skill or preference.

INSTRUCTIONS TO PARENTS FOR AN OPERATION TO BE PERFORMED AT 2 P. M.

PREPARATION FOR THE OPERATION.

In order that the operation may be painless, it will be necessary to administer an anesthetic (ether). These directions must be most carefully followed so that the anesthetic may be safely administered.

1. The evening before the operation, give two teaspoonsful of castor oil, or any other good cathartic. 2. On the morning of the operation, the child should have a light breakfast (one soft egg, bread and milk) at eight o'clock. 3. After this light breakfast, food of all sorts, milk included, should be absolutely prohibited. The child may have water to drink during the morning, but after twelve o'clock not even water. He should be watched to see that he does not get food without your knowledge.

The room in which the operation is to be performed should be on the same floor on which the child is to be put to bed, and the temperature of the room should be 76° to 80° . An open fire, such as a grate, cannot be allowed to burn in the room while the anesthetic is being given. There should be one good, bright window, from which all lace curtains have been removed. Have ready in the room the following articles: One kitchen table, 1 blanket, 3 sheets, 6 towels, 1 large bath towel, 10 napkins, 1 large granite basin, 1 flat saucer, 12 or more newspapers, 2 small stands or chairs, and one thermometer.

CARE OF THE PATIENT AFTER THE OPERATION.

1. The child must remain in bed until the second morning following the operation. Only one person should be with him and the room should be kept as quiet as possible. 2. At 6 p. m., if he complains of thirst and is not vomiting, cold water may be given, a teaspoonful at a time, at five minute intervals. If no vomiting follows the first few doses, the amount may be gradually increased. Vomiting of blood once or twice does not indicate hemorrhage. It is simply the blood which the child has swallowed immediately after the operation. 3. Food: Do not ask the child if he is hungry. It is not necessary for him to have food until the following day. If he

complains of hunger and has not vomited for two hours, teaspoonful doses of cold milk may be given at intervals after 7 p. m., and the amount gradually increased if there is no vomiting. 4. The second day following the operation, the child may be up and about the house, but should not run and play. His diet for the first day should be liquid, water freely, milk, soups, and ice cream. Eggs, custards, milk-toast and soft foods should be given on the second and third days. As the soreness decreases, the usual diet may gradually be resumed. On the fifth day after the operation, he may be taken out of doors if the weather is favorable. 5. Soon after the operation, there may be pain in one or both ears. To relieve this, hot applications (hot water bottle, hot flannels, etc.) or cold (ice bag) may be used.

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Laryngeal Diphtheria Experiences. C. H. SHUTT, *Jour. A. M. A.*,
Feb. 5, 1910.

C. H. Shutt thinks that non-instrumental methods are worthy of more frequent trial, at least in hospital practice, in cases of laryngeal diphtheria with only slowly increasing dyspnea, only moderate exhaustion, and slight cyanosis. The local measures consist chiefly in inhalations, securing of favorable surroundings and perhaps the induction of vomiting to aid in removing loosened membranes. General medical treatment consisting of antitoxin and stimulation as needed, cathartics, diuretics, etc., should be employed as in pharyngeal diphtheria. Antitoxin should be employed in all cases and as early as possible, and he prefers moderate-sized doses repeated every four to six hours as more effective and less depressing than massive ones. When the patient is very weak, toxic or much cyanosed, surgical or mechanical measures are indicated and the choice is between intubation and tracheotomy. The author's conclusions are as follows: "Physicians should be prepared and expect to treat laryngeal diphtheria which usually presents as an emergency. Although possessing intubation instruments, the physician may find himself without them in an emergency and be compelled to attempt tracheotomy. Non-instrumental methods of relief are worthy of more frequent trial, especially in institutional work and in those cases in which dyspnea is increasing slowly, exhaustion is moderate, cyanosis is not severe and the surroundings are favorable. Intubation may be performed in cases in which the symptoms indicate recent and closely adherent membranes. It should be employed only when intelligent nursing may be had and when the physician is within easy reach."

THE ETIOLOGICAL RELATION OF DISEASES OF THE EAR, NOSE AND THROAT TO DISEASES OF THE HEART, LUNGS AND BLOOD.*

BY ROBERT LEVY, M. D., DENVER.

Taking a casual view of this subject it would seem as though one might dispose of it easily and briefly. On second thought, however, and especially after reviewing available literature, one is impressed not only with the importance of the topic but also with its unsatisfactory and unscientific status. Clinical evidence points strongly to the fact that diseases of the lungs and heart occur in connection with affections of the upper respiratory tract as complications and also as sequels to such affections. Other clinical evidences point to affections of the upper respiratory tract occurring as complications and sequels to diseases of the heart and lungs. There appears to be a marked co-relation which it is difficult to analyze and which scientific investigation has not as yet satisfactorily explained. If one could positively determine a local cause for certain respiratory affections, how important this would be in determining the line of treatment. For many years asthma and emphysema have been known to be associated with and in a measure dependent upon diseases of the nose. These affections have not always been obstructive in character. Chronic ethmoiditis with moderate or extensive polyp-formation has been supposed to be an important cause. A few men hold to the view that in such cases asthma is positively the result of the local cause. This cannot be substantiated by the results of treatment. Case after case may be presented to prove its fallacy. Acting, however, upon the hope that by thoroughly remedying the intra-nasal condition, the asthma would be cured, radical surgical measures have been instituted. The sum total appears to be, cure in a few cases, relief in many, no improvement or increase of trouble in others. As to the process by which asthma and emphysema are caused by diseases of the nose we have a variety of views. The reflex cause through the fifth and pneumogastric nerves has been generally accepted. Francis has tried to show that the nose maintained a certain respiratory equilibrium which was disturbed in asthma. He believes

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that operative interference is never indicated and, in fact, states that the cases in which no operation has been performed are those in which the best results have been obtained.

When the lesion in the nose is obstructive in character, it is believed by some that this in itself may act as a cause. The valuable and elaborate experiments of Anderson, of Detroit, furnish much evidence in proof of this contention. Anderson writes that "partial closure of the nostrils in dogs is followed by symptoms resembling asthma and emphysema."

Adenoids have been recognized as a cause of asthma and sufficient cases have been observed to prove at least some relationship. It is my belief that adenoids may have a bearing upon the development of asthma, especially in children, in whom a hereditary hay-fever or asthmatic history exists. The cases of this kind that have come under my observation have not presepted adenoids of sufficient degree to produce obstruction and have therefore led me to believe in the reflex influence. It is surprising to see how small an amount of adenoid hypertrophy is apparently causing symptoms and one would hesitate to ascribe such symptoms to the presence of these small masses were it not for the very pronounced relief obtained by operation.

Recurring attacks of bronchitis in children may often be ascribed to adenoids. The manner in which this is brought about is also open to speculation. Freudenthal, who has done so much along this line in an article "On the etiology of pulmonary tuberculosis in its relation to diseases of the nose and throat," states that the "naso-pharynx would form a reservoir in which foreign bodies, etc., would be retained for the protection of the whole organism." He also states that "we should expect to find bacteria there in normal conditions, but much more so in pathological conditions." If this is true, it is easy to understand the views of many other authors who believe infection of various kinds may take place through this source and that bronchitis may be one of the most frequent manifestations. Bero describes under the name of adenoid pneumonia, certain types of this disease occurring with adenoid growths and believes that relapses are very likely to take place unless the growths are removed.

Infections through the lymphatic tissue constituting Waldeyer's ring have long been recognized as the most reasonable explanation of certain diseased conditions. We have seen endocarditis, septic in character, follow tonsillitis. The laboratory has demonstrated the presence of tubercle bacilli in apparently non-tubercular tonsils

and adenoids, and the development of cervical lymphadenitis and pulmonary tuberculosis. The question, however, is far from settled for it has been shown by anatomical investigations that enlargement of cervical glands can be more easily explained by infection from below than infection from above.

Our beloved and lamented colleague, Dr. Solly, often stated that he believed there was a definite relation between nasal obstruction and pulmonary tuberculosis, that the lung involvement was in a measure influenced by the nasal cavity obstructed. That this observation had a basis of fact is also believed by Freudenthal, who states that we "cannot help noticing at the first glance how often the pulmonary and nasal lesions are on the same side." Not only is this true of obstructive lesions in the nose, but one must also be impressed with the frequency with which tuberculosis and other nasal lesions are associated. In Freudenthal's cases, one-fourth had atrophic rhinitis. Harlan calls attention to this point in an article on the "Diagnostic and prognostic value of an examination of the throat in pulmonary tuberculosis." The dryness of the nasal and pharyngeal mucous membrane in these cases is our daily observation. One cannot, however, conclude from this that chronic rhinitis is an important factor in the development of tuberculosis. It may, when existing for many years prior to the tuberculous infection, lower the resistance of the mucous membrane of the entire upper air tract and may thereby offer excellent opportunity for the invasion of pathogenic bacteria. It would seem more reasonable to explain the dryness of the nose and pharynx by the general lowered vitality and lack of nutrition from which tuberculous patients suffer not only when the affection is well established, but also for a considerable period before pronounced symptoms are detected. On this same hypothesis may be explained the congestive and consequent obstructive lesions of the nose which are manifestations of lowered vaso-motor tone.

There have not been many accurate observations bearing upon the relation of diseases of the upper air passages to the heart and blood-vessels. Septic endocarditis, which has already been referred to, interference with the nerve-supply of the larynx from aortic aneurism are sufficiently well recognized. Obstructive lesions of the heart are capable of so interfering with the circulation that congestive disturbances of the nasal and pharyngeal mucous membrane become prominent symptoms. It is frequently useless to treat certain forms of chronic pharyngitis by local measures, especially when the mucous membrane presents a purplish-red, almost

cyanotic appearance. In these cases one should not fail to investigate the circulatory system.

As to the relation between diseases of the ear and heart and blood-vessels the most familiar example is found in the complications of sinus thrombosis.

It will be seen by this short paper that it has not been my purpose to clear the atmosphere of the unscientific state of our knowledge, but rather to emphasize that there does exist an important etiological co-relation between diseases of the ear, throat and nose and those of the lungs, heart and blood-vessels.

California Building.

A Contribution to the Study of the So-called Bone Cysts of the Middle Turbinate. R. H. SKILLERN, *Arch. f. Laryngol. u. Rhinol.*, Bd. 23, p. 254, 1910.

The author calls attention to the diversity of opinion in the genetic pathology of these structures. The general trend of opinion of the various investigators seems to endorse the theory of Zuckerkandl, namely, that of congenitality with subsequent dilatation and enlargement due to inflammatory changes. Harmer differentiates four conditions in connection with this affection: 1. Ethmoid cell in the middle turbinate anomalous but normal. 2. Cyst in the middle turbinate. Knochenblase (anomalous but normal). 3. Pyocele of the middle turbinate. Empyema (pathological). 4. Mucocele of the middle turbinate (pathological).

Do these cysts grow larger during adult life or do they retain their original size? Can the growth of the bone cyst be influenced by some internal condition? Is some external condition responsible for the subsequent growth of the bone cyst?

Deductions from clinical experiences and examinations may be summed up as follows: 1. These so-called cysts of the middle turbinate are genetically anomalously situated ethmoid cells. 2. Under certain conditions they can enlarge without the presence of any pathological product. 3. Pathological conditions such as empyema, pyocele and mucocele can contribute toward their enlargement. 4. Histological changes in the mucous membrane and bone at the base of the cyst are due to mechanical irritation. A. A.

SOCIETY PROCEEDINGS.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, February 15, 1910.

DR. GEORGE E. SHAMBAUGH, CHAIRMAN.

Suppurative Ear Diseases in Diabetes. By O. J. STEIN, M. D.

(Published in full in the July, 1910, number of THE LARYNGOSCOPE, p. 731.)

DISCUSSION.

DR. C. M. ROBERTSON: These cases, when the discharge begins, are very much like the cases that complicate influenza, where there is a large destruction of tissue in a very short period of time. The resistance of the body is *nil*, and there seems to be a peculiarity in regard to different individuals. The patient may have much sugar, with the presence or absence of diacetic acid or acetone, and healing takes place promptly. In another case the tissues, after the operation, lie as if dead, and most operators treat the wound as an open one, because if they close the wound the tissues slough. Any anesthetic used must not irritate the kidneys, therefore ether is contraindicated. Chloroform or gas should be used. In one case, reported by Dr. Stein, the operation lasted over 3 hours. It is the first case I have ever heard of that survived, where the operation lasted more than 45 minutes or an hour. The percentage of cases that terminate fatally is very high, probably 60 to 75 per cent. These cases must be differentiated from cases that are tubercular. In a tubercular ear you get a better result after operation than in a diabetic ear. The occurrence of sinus disease brain-abscess and meningitis, in these cases is very large. In nearly every case of diabetic mastoiditis an epidural abscess, with thrombosis of the lateral sinus, is present. More patients die from this cause than from infection of the internal ear or labyrinth. It seems to make no difference whether the eye grounds show a diabetic change or not. There seems to be no particular line from which conclusions can be drawn as to whether or not the patient will get well. Young people, of course, are more liable to die than older people, although most of the cases reported have occurred in people over 50 years of age.

Auto-Vaccine in Nasal Accessory Sinus Infections. By FRANK E. BRAWLEY, M. D.*(Published in full in this issue of THE LARYNGOSCOPE, page 877.)*

DISCUSSION.

DR. MARY LINCOLN: In all cases of infection in which the auto-vaccines are going to be used, blood-cultures should be made on blood-serum or blood-agar, in order to imitate conditions present in the mucous membranes from which the material is taken. Subcultures are made from the plate colonies in about 48 hours, and from these a careful and thorough study of the organisms present can be made. It must be remembered that some organisms grow readily on artificial media, but are not very virulent, while others are extremely virulent and grow but poorly. That is possibly one reason why laboratory reports are sometimes unreliable. The organisms that grow most readily were reported, while the others escaped notice. Studying a smear at the same time that a culture is made will give the most valuable information. It will show all the organisms present, and this study, combined with the study of the culture, will often tell us which organism is causing the trouble. Besides, when we come to studying the cultures, we might not be able to tell whether the causative germ had been isolated, and in the vaccine therapy that is of the greatest importance. It is also important to know the normal flora of the mucous membranes, so that the flora of infections can better be studied. We have much to learn as to the normal flora and still more as to the organisms present in infections. Certain clinical pictures are produced by certain groups of organisms. One of the great difficulties is that the cultures studied in laboratories have to be studied under artificial conditions, and it is sometimes impossible to come to an agreement when we compare these studies with the studies made of smears.

Having made a study of the flora that causes the infection in the case in point, the next step is to make a vaccine either of the mixture of the organisms or of pure cultures of each organism. We are working more or less in the dark when we attempt to give vaccines made from mixed cultures. If we use a mixed culture we get billions of organisms that grow very readily, and yet are not very virulent, and few or none of the organisms that grow poorly and are virulent.

The dosage is another point that cannot be determined with any degree of accuracy in a mixed vaccine. For instance, of staphy-

lococcus we may give from one to two thousand million at a dose. It is very unwise and dangerous to give more than a few million of bacilli that are found in mucous membranes, and if we have a mixed vaccine we might not want to give enough staphylococci to be of any value, because we might be giving a dangerous dose of the bacilli.

A case of gingivitis had been treated by a dental surgeon with a stock vaccine without any result; in fact, the patient was getting worse. We examined the gums bacteriologically and found a very large number of small gram-negative bacilli and a few staphylococci and a very few bacilli, both large and small, but the prepondering organism was the small gram-negative bacillus. The culture showed a luxuriant growth of staphylococcus. By careful watching we obtained finally a culture of gram-negative bacillus, from which we made a vaccine, giving from ten to twenty-five millions at first, the patient rapidly improved, showing that the bacillus might easily have escaped if we had used a mixed vaccine.

DR. JOSEPH C. BECK: I began my experiment about three years ago and then reported 14 cases of ear, nose and throat infections of a chronic type, in which I used auto-vaccines of a different form of infection. Since then I have made subsequent reports, including about 60 cases in all. I am not now as enthusiastic as I was in the beginning, nor are my results as good, but I am encouraged by the therapeutic value of this measure, as an aid in the treatment of suppurative diseases of the nose and accessory sinuses.

The flora of the nose has been referred to. That is the one point of importance. The cultures we get are practically all staphylococci, but there are other organisms which possibly play a rôle in chronic infections and if vaccines are not obtained from them, the results in many instances will remain negative. This has been brought forcibly to my attention in the cases of two physicians who had chronic infection of the nose. I had recommended auto-vaccines. Both made the vaccines by using the secretions as they come from the nose. Both men have studied Wright's work thoroughly, and they sterilized the vestibule of the nose, blew out the secretions, sterilized them, and without dosage or opsonic index injected the sterilized secretion. Great improvement followed in both cases, without any other treatment whatsoever. Both men suffered a great deal from local reaction at the site of injection. Dr. Brawley reports cures. I should like to ask him how

long it it is since these cases have taken place. I have had cures because I paid attention to the local condition. The general condition is markedly influenced. The patient gains in body weight from the use of the vaccines. Stock vaccines are useful, especially those of the polyvalent type. They are made from 13 different cultures and the mixture of aureus, albus and citrouis gives the best results.

DR. A. M. CORWIN: I want to congratulate Dr. Brawley on his enthusiasm in entering this new field—a field in which demonstration has been open to serious doubt. The fraternizing of laboratory and clinical practice is to be encouraged. However, I did not get the impression from the paper that Dr. Beck seems to have got, that Dr. Brawley claims a large number of cures as the result of vaccine therapy. He reports a number of improvements, but these occurred in cases in which the usual operative treatment looking toward better drainage and ventilation and thorough irrigation had been given, and we all realize that even in chronic cases such improvement is to be expected. Then, too, many of his patients disappeared from view before definite results were obtained. It would seem as though, if vaccination will prove anything, it is to be applied in cases, in which no other form of treatment is used, so that results can be noted with precision. Then, there are patients in whom, after ordinary operation, the chronicity of the symptoms continues. What can vaccine therapy do for these? It is only by having a large number of carefully tabulated cases that any conclusions can be drawn, and the negative reports in such cases are of as much value as are the positive ones. We are too apt to follow up a thing that is seemingly curative and report good results, and when we find a series of failures we are loath to publish them. The value of Dr. Brawley's paper will come five or ten years hence, if he continues to push his investigations; then more conclusive data can be presented. The paper is of little advantage, except to stimulate our interest and focus our attention upon this new field of investigation.

DR. C. M. ROBERTSON: Dr. Corwin's remarks are discouraging because, if all cases are followed to the very end, we must have 100 per cent of failures as all these patients will die some time. If a cure persists for one year, that is sufficient. Most of Dr. Brawley's cases occurred in 1907, and he knows as well as anybody when a cure has been effected.

Nothing was said about any vaccines except the auto-vaccines, and nothing was said of auto-vaccines being used that were not produced on the infected premises. All Dr. Brawley's cases except one were chronic cases, and even the exception was a case of 5 months' duration. Some cases had persisted from childhood. Most of them for 6 months or more. In all his cases he used the staphylococcus auto-vaccine. To answer Dr. Corwin, I have had one case, a woman, who had a pansinusitis, and although she had an enlarged bulla that pressed the middle turbinal against the septum, and had hypertrophy of the middle turbinal that blocked the hiatus, I used the auto-vaccines to see what would happen. I started with 5,000,000 and doubled the dose every day when there was no reaction. If the temperature rose, I waited until the following day. I kept this up for 10 or 12 injections, at which time the discharge was stopped. Then I waited for a month or two, had the patient report, and again after a year. There was no return of the discharge. In this case an operation was indicated to the extent of trimming the anterior end of the middle turbinate and opening the bulla and all sinuses that were involved. I have had other cases in which I tried the auto-vaccines, and the point made by Dr. Lincoln was substantiated, that the germ causing the disturbance is the hardest to cultivate. I have never tried the smear examination, although I believe that that is where most of us have fallen down.

Some time ago Dr. Gehrmann told me that he could make an auto-vaccine from any germ injected and get results. I have had some experience in that direction. I have had cases where there was no appreciable change in the discharge, and in one or two the application of a strong solution of argyrol stopped the discharge. Trimming the turbinate and opening the tracts has produced results where auto-vaccines fail.

I have also tried the bacillus bulgaricus and obtained results when every other organism failed, so that it seems to me we are just on the threshold of learning something about this subject. We are getting reports from men who know, and after we get a few more data we will be able to see what cases can be relieved by this method of treatment, and those where the treatment is not indicated.

DR. HENRY GRADLE: Of fifteen instances of sinus and ear disease in which I have used the vaccines some of the cases have not been followed sufficiently to state permanent results. A

number have shown no benefit evidently on account of insufficient drainage. Amongst them were several in whom a rise in the opsonic index was measured by Dr. Lincoln and yet the clinical condition was not influenced. The healing tendency started by vaccination is not sufficient to lead to results when there is an interference with the free escape of the pus.

The most positive instances I have seen are the following: A girl having had for a long time a purulent discharge of chronic ethmoiditis got an acute mastoiditis requiring operation. On account of exposure of the sinus and a doubt whether the diploetic cells had been cleared sufficiently I gave her 4 injections of staphylococcus, which had been found in the mastoid discharge in intervals of a week. There was prompt healing of the mastoid wound, and at the same time the ethmoid discharge containing also staphylococci ceased permanently after having resisted previous conservative treatment.

The second fairly demonstrative instance was a one-sided maxillary empyema dating back nearly a year, but causing no local symptoms except discharge. The patient came on account of a fresh retino-choroiditis on the same side. Since no other cause could be learned it seemed reasonable to consider the eye disease secondary to that of the antrum. (I have published last year four observations of this character in which this relationship was quite conclusively shown in two). An attempt to perforate the nasal wall of the antrum was abandoned at the patient's request when the bone was found unusually thick. A few staphylococcus injections were given on finding this germ, whereupon the nasal suppuration disappeared gradually. The retino-choroiditis healed likewise. But from the clinical course one could not say positively that the cure of the eye disease had been brought about by the vaccination.

In a case of subacute frontal sinuitis staphylococcus injections combined with the usual nasal treatment had apparently no effect until I removed the front end of the middle turbinal. Notwithstanding considerable relief from the pain after the operation the discharge changed but very little until I resumed the vaccine treatment when it finally ceased.

In an instance of multiple sinusitis I had exposed the antrum by almost complete removal of its nasal wall and could hence look into it. The staphylococcus and the pyocyanus were found and the vaccine treatment with both germs was thoroughly tested un-

der the guidance of the opsonic measurements made by Dr. Lincoln. But it proved of no influence whatsoever, although in this instance the antrum at least had absolute drainage.

A physician had a persistent suppuration through a small perforation in Shrapnell's membrane. There was no odor and a very trifling sero-purulent discharge, which did not yield to the usual treatment (gauze drainage and boric acid). Staphylococci were found present. He had an autogenous vaccine made and 3 injections cured the discharge. Yet I have had several cases of similar character in which negative results were obtained.

We must always assure ourselves that in every instance drainage is not interfered with, and that there is no mechanical impediment which dams back the discharge before we can expect to get any results from auto-vaccination. Moreover, we are not at all sure as yet that the principle of auto-inoculation with the germ causing the disorder is appropriate in all cases of infection. It has been shown to be true of the staphylococcus and some other germs, but whether it applies in the case of all germs is a question still to be solved.

DR. W. L. BALLINGER: This discussion has been most conclusive. It has proven to me that we do not know very much about the subject. So many contradictory statements have been made, and we cannot draw any conclusions as yet from the evidence at hand. The results seem to be practically negative. Dr. Lincoln says that such and such conditions must be present before we can draw conclusions. Many clinicians report results entirely opposed to the laws laid down by the bacteriologist. Some reports are fairly satisfactory, others are not, because the cases have not been followed sufficiently long. It seems to me that Dr. Corwin and Dr. Gradle have discussed the problem from a rational point of view. They have called attention to the dangers of conclusions based on such meager evidence. I have had some experience in the use of vaccines, and apparently satisfactory, but I am not ready to say that vaccine therapy is a very reliable method of treatment, except in very exceptional cases. I believe with Dr. Gradle that we must remove the mechanical impediments before we can hope to gain results. I think Dr. Brawley takes the same position.

DR. J. HOLINGER: The cases mentioned so far have been positive as to bacteriologic findings. I had a personal experience last spring that was rather interesting. I was treating a lady who had

suppuration in both nares, necessitating a residence in California for several winters. She had pan-sinuitis. Both maxillary antra discharged much pus. I did a radical operation on both sides, and she improved a little, but the middle turbinals were so hypertrophied and pus exuded from different parts, so that I had to remove both the middle turbinals, naturally giving her very wide nostrils. She improved somewhat, but returned again in the early summer. There was still some discharge. I saw her again in November and again in January. There was always some discharge, with crust formation. I intended to begin auto-vaccine treatment. After the first examination I made of this patient I had a very bad infection of the nose and the accessory sinuses, with a copious muco-purulent discharge. This condition recurred after each examination I made of this patient. Repeated bacteriologic examinations of the discharge from my frontal sinuses proved negative, although every precaution was taken to have the examination as thorough as could be made.

DR. A. H. ANDREWS: My impression is that as long as we employ this plan of treatment indiscriminately, we naturally will have a large percentage of failures. After all, the most important thing is the pathology present, and the treatment must be adapted to this. I am not sure that the stock treatment of syringing these cavities is as good as some other plan of treatment, where there is no definite obstruction or any necrosis of the bone. My own experience in the local treatment of these cases is that they have got along far better under the treatment of blowing out the pus with compressed air, followed by some mild medication, than where I have syringed.

DR. BRAWLEY (closing): I simply intended to present a preliminary report of the results I have had in a few cases. They were early cases and my observations were not as accurate then as they are now. One case in which I operated on the sphenoid and ethmoid cells I have seen occasionally, and the patient tells me she has not had an attack of cold since the vaccine treatment, though autumn and winter colds had been a frequent occurrence with her previously.

I have the histories of about 30 cases which have not been watched long enough to report on at this time. One thing I have noticed is the results obtained in what I call the sub-acute cases—cases that have run a few months or less than a year. There seems to be something about the chronic cases that walls the sin-

uses off, as it were, from the general circulation. I have never seen the pathology which would explain this, but I have seen the clinical manifestations often. I know that various kinds of vaccines have been used, and results have been obtained that could not be explained entirely by the sort of organism used. I take it that many of these cases have been helped by the stimulation of the ductless glands, which was given by the toxins. These vaccines are carefully heated to 60° C., in order not to destroy the toxins which have the property of acting on the ductless glands entirely independently of the production of auto-vaccine within the blood serum. I have seen that clinically for years in the improvement of the general health which follows such infectious diseases as typhoid. That, I think, will likely explain a number of cases where we have got good results, even when the organisms employed were not the proper ones.

Physiologic Vestibular Nystagmus. By J. P. FLETCHER, M. D.

Nystagmus (eye movements alone meant) may be divided into two types—vestibular and ocular. It is necessary to distinguish sharply between them in order to avoid error. The characteristics of each are as follows: VESTIBULAR: Rhythmic movements, of equal excursion, but unequal velocity. Has two components, quick in one direction, slow in the other. Increases when gaze is directed to side of quick component; decreases or stops when directed to side of slow component. Does not cease when eyes are closed. It is either horizontal, rotary, vertical or compound. OCULAR: Undulating eye movements of equal excursion and velocity. No quick component. Not increased by gazing to either side, but ceases with fixation of vision in any direction. Ceases when eyes are closed. Never compound or rotary. The vestibular apparatus is the chief organ of equilibrium. Each canal produces nystagmus in its own plane. The end organ of the vestibular nerve functionates when the endolymph contained in a membranous canal flows against its cupula. Motion of the cupula causes tension of the hair-like epithelial prolongations of the cells of the crista ampullaris. This tension causes a sensation which is transmitted through the vestibular nerve to Deiters' nucleus and is there interpreted and notice sent to the auxiliaries of equilibrium—that the vestibular apparatus is functioning. These auxiliaries are sight and the muscular sense. The direction is designated by the quick component, as this is the most obvious. In

reality the slow is the vestibular component. The quick comes from the gyrus angularis and is a movement of recovery or counter motion.

NYSTAGMUS BY TURNINGS (Dreh Nystagmus). Nystagmus by turning has three stages; primary, during turning; after-nystagmus, immediately after turning ceases; ultimate nystagmus, which sometimes follows after-nystagmus. Nystagmus during turning is in the direction of turning; after-nystagmus is in the opposite direction of turning, except when the head is inclined 90° backward. When ultimate nystagmus occurs it is in the same direction as the primary, but is very slight and of short duration. The plane of the nystagmus depends upon the position of the head during turning. Flourens showed that the horizontal is the typical functioning plane; therefore, the canal or pair of canals which we wish to excite by turning must first be brought approximately into the horizontal plane; for example, when the head is placed forward at an angle of 90° to the vertical, the anterior vertical canals are about in the horizontal plane. Turning in this position will produce a pure rotary nystagmus. At 45° forward the result will be a compound nystagmus, horizontal and rotary, etc.

CALORIC NYSTAGMUS: Caloric nystagmus is produced by application of heat or cold to the tympanic cavity. Heat produces nystagmus to the heated side; cold to the opposite side. The plane of the nystagmus from heat is rotary, from cold compound, horizontal or rotary. When temperature equal to that of the body is applied, there is no reaction. When higher or lower temperature than that of the body is applied to both sides at the same time, nystagmus occurs to either side by looking in the extreme lateral direction. It ceases immediately upon fixation of vision straight ahead. Accompanying symptoms, vertigo, nausea and vomiting are quite frequent in rotary nystagmus. Seeming movements of nearby objects, or of the body of the nystagmatic person are not uncommon in all kinds of nystagmus.

GALVANIC NYSTAGMUS: Catelectrotonus produces nystagmus to its own side. It equals heat in caloric nystagmus. Anelectrotonus produces nystagmus to the opposite side and is equal to cold in caloric; 2 to 4 ma. are required when both electrodes are placed on the head, 20 to 24 ma. when one is by the ear and the other in hand of the same side.

VESTIBULAR ATAXIA. Reactionary body-movement is always in the opposite direction to the quick component. The plane of falling must be considered with relation to the earth. Manifestly one cannot fall in the horizontal; therefore, horizontal nystagmus produces no reaction. If, however, rotary nystagmus is made horizontal (with relation to the earth) by bending the head 90° forward reactionary body movement will take place in the plane of the nystagmus (with relation to the head) viz; rotation. The ataxia bears no relation to the intensity of artificially-produced nystagmus.

THEORY OF SYNCHRONISM: It is impossible for me to conceive one canal functioning while its fellow of the opposite side is at rest, because in nystagmus by turning, both cupulae are moved by the flow of endolymph at the same time and in opposite directions. There must, therefore, be a direction of greatest and one of least physiological activity. That canal governs in which the movement is in the direction of greatest physiological activity. There is a position of rest when neither is functioning. I accept turning and the caloric test as a better index to the direction of greatest and least physiological activity than the experiments of Ewald and Hogyes as the latter involve trauma and violence. Cold produces compound nystagmus to the cooled side, which is stronger than that by heat. It is therefore plus. The cupula in the anterior vertical canal moves towards the utriculus; in the horizontal, away from it. These directions must, therefore, be the greatest physiologically. In turning to the right the endolymph moves from the utriculus into the open mouth of the left ampulla and downward in the horizontal canal. The impact here, during turning, is consequently greater than in the right as the endolymph must flow upward through the ampulla to the utriculus. During turning the left dominates; after turning the flow is reversed and the right dominates. It is more than probable that the same principles govern the posterior vertical pair, modified only by the anatomic positions of the canals and their cristae.

BOOK REVIEWS.

The Operations of Aural Surgery. Together with Those for the Relief of the Intracranial Complications of Suppurative Otitis Media.

By C. ERNEST WEST, F. R. C. S., Aural Surgeon to St. Bartholomew's Hospital, London, and Sidney R. Scott, M. S., F. R. C. S., Assistant Aural Surgeon to St. Bartholomew's Hospital. Octavo; 22 illustrations. Cloth, \$2.00 net. P. Blakiston's Son & Co., Philadelphia, 1909.

This is a refreshing little practical volume, full of good hints and suggestions of technic in aural surgery. The author presents many minutia of technic which are often overlooked in some of the more elaborate textbooks. It is essentially a working companion to the aural surgeon and as such deserves a place in every library on otology.

Album of the Spas and Mineral Springs Owned by the Royal Prussian Board of Domains.

Described, by order of the Minister of Agriculture, Domains and Forests, by DR. STERN, Royal Inspector of Baths, Langenschwalbach. Translated by Dan. Heuser, London. Pp. 166, handsomely illustrated. Printed by the Aachener Verlags-und Druckerei-Gesellschaft, G. M. B. H. Aachen. U. S. Agents, G. Von Der Bruck, 61 Park Place, New York.

Hand-book of Therapy.

Cloth. Price, \$1.50. Pp. 421. Chicago: American Medical Association, 1910.

The Therapeutic Department in the *Journal of the American Medical Association* has been commented on so often and so favorably that the Association decided to reprint in book form, the articles which seemed to be of most practical value to the general practitioner. Conditions governing therapeutic requirements are stated as clearly and concisely as possible. Special care has been taken to avoid unusual drugs, and with rare exceptions the formulas given are combinations which can be easily compounded by any pharmacist.

Text-Book of Diseases of the Nose, Throat and Ear, for the Use of Students and General Practitioners.

By FRANCIS R. PACKARD, M. D., Professor of Diseases of the Nose and Throat in the Philadelphia Polyclinic Hospital and College for Graduates in Medicine; Aurist to the Out-Patient Department of the Pennsylvania Hospital. Pp. 369, 3 plates and 135 illustrations. Cloth. Price, \$3.50. J. P. Lippincott Co., New York and London, 1909.

This book on diseases of the nose, throat and ear is intended for the use of students and general practitioners and contains so much of practical value from the long experience of an active worker in oto-laryngology, that it must also be recognized as essentially the hand-book of the specialist.

The characteristic feature of Dr. Packard's book is that of personal experience. His many years of service and training in detail work adds much to the value and is emphasized by the terse style of expression, excellent

arrangement and classification of the subject-matter and the many original illustrations.

We regret to note the brief space assigned to the consideration of diseases of the accessory nasal sinuses; the question of the Asch operation for correction of deformities of the nasal septum is still given liberal consideration.

From the publisher's point of view the only criticism that we frankly offer is, that the reproduction of the radiograms and of some of the illustrations shows considerable imperfections. The chapters on diseases of the ear and their treatment are handled rather more briefly than those on the nose and throat. The general typography is good.

New and Non-Official Remedies, 1910.

12mo. 256 pages. Cloth, 50 cents; paper, 25 cents. Chicago. American Medical Association. 1910.

This book contains descriptions of the articles which have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association prior to January 1, 1910. A slip comes with the book stating that "Supplements will be issued to New and Non-official Remedies, 1910, containing additions, corrections, omissions, etc., free to those who having the book, fill and return the blank. The index covers 34 pages.

Minor Ophthalmic and Aural Technic.

By ALFRED NICHOLAS MURRAY, M. D., Chicago, Assistant in the Department of Otology and Laryngology, Rush Medical College. Cloth. Pp. 233, with 98 illustrations. Price, \$3.00. Chicago: Cleveland Press, 1909.

A timely book on practical subject-matter pertaining to the treatment of the eye and ear, as it occurs in the daily practice of the general practitioner. It is an aid to the general practitioner and contains many valuable hints to the specialist. It may be read with much profit by the professional nurse, and contains many excellent suggestions for the post-graduate.

The style of the author is terse, the illustrations are well selected and the subject-matter conveniently arranged.

Lecons sur les suppurations de l'oreille moyenne et des cavités accessoires des fosses nasales et leurs complications.

By DR. LUC. Second Edition; pp. 584. Price, 12 fr. J. B. Baillière et Fils, Paris, 1910.

Since the appearance of the first edition of this book, ten years ago, much progress has been made in this field and the author, who has actively contributed to this progress, has enriched his book with his experiences. He has also retouched the subjects discussed in the previous edition, treating them in the light of recently acquired knowledge.

The chapter on "Surgical Work on the Jugular Sinus" is a very happy addition to this volume as is also that on the "Treatment of Laryngeal Phthisis."

Hand-book of Diseases of the Ear. For the Use of Students and Practitioners.

By RICHARD LAKE, F. R. C. S., Eng., Surgeon, Disease of the Ear, etc. London School of Clinical Medicine; Surgeon to the Royal Ear Hospital, etc. Pp. 248, with 4 colored plates and 66 original illustrations. Third Edition. Price, \$2.75. New York: William Wood & Co., 1910.

While this little volume does not presume to occupy the position of a complete treatise on otology, it must be said to the credit of the author that he has embodied in the 250 pages of this hand-book more originality and

individuality in the selection and treatment of subject-matter, than is found in many of the larger text-books. It is a compliment to Dr. Lake that this hand-book has reached its third edition in so short a time.

In its present form, consideration is given tubal obstruction, oto-sclerosis, diseases of the internal ear, differential diagnosis and intra-cranial complications; in short, it is as much up-to-date as are the newest text-books and treatises on otology that have recently appeared.

It is concisely written, crystalized in thought and invaluable to the under-graduate in medicine and the post-graduate. Even the otologist may obtain many valuable suggestions by perusing Dr. Lake's pithy pages.

Die Komplikationen der Stirnhöhlenentzündungen. Beiträge zur Anatomie, Pathologie und Klinik der Stirnhöhlen.

By DR. P. H. GERBER, Director of the Königliche Universität-Policlinik for Nose and Throat Diseases in Königsberg. Pp. 457, with 36 illustrations and 2 plates. Price, 16.60 mk. S. Karger, Berlin, 1909.

This monograph is an extremely valuable contribution; the complicated subject-matter is presented in a very clear and terse manner; the author's observations accompanying the numerous clinical reports and statistics add weight and importance to the text. This is perhaps, the most extensive and complete monograph that has as yet been published in the consideration of complications of inflammatory process of the frontal sinus; the volume is essentially a reference book for the specialist in rhinology and is a classic of its kind.

A Manual of Otology.

By GRAHAM BACON, A. B., M. D., Professor of Otology in the College of Physicians and Surgeons, Columbia University, New York, etc. With an introductory chapter by Clarence John Blake, M. D., Professor of Otology in Harvard University, Fifth Edition, revised and enlarged. Pp. 508; with 147 illustrations and 12 plates. Cloth, \$2.25 net. Lea and Febiger, New York and Philadelphia, 1909.

This manual is presented in its fifth edition, the best evidence of its continued popularity; it is up-to-date and notwithstanding the increase and stimulation of otological subject-matter in recent years, the author succeeds in keeping his text fresh and crystallized. It continues to hold its place as one of the favorite American text-books of students and post-graduates.

Rhinology. A Text-book of Diseases of the Nose and the Nasal Accessory Sinuses.

By PATRICK WATSON WILLIAMS, M. D., Lecturer on Diseases of the Nose and Throat at the University of Bristol. Cloth. Price, \$4.20. Pp. 273, with illustrations. New York, London, Bombay and Calcutta: Longmans, Green & Co., 1910.

As the result of a ripe experience with four successful editions of his former work on the nose and throat, the author has decided to separate the two specialties and devote a volume each to rhinology and one to laryngology. The fact that the text in the present publication occupies the total space devoted to rhinology in the fourth edition of the former work, justifies the author's views and indicates the rapid advances made in recent years in this field.

Like the former work, Dr. Williams' present publication contains a masterful presentation of the anatomy of the nose and its accessory sinuses, and the quality and quantity of the illustrations in this second edition are more acceptable than any that has as yet been published.

The stereoscopic plates contribute much to a more careful study of detailed anatomy and pathology in this field. We believe Dr. Williams was

the first to embody this volume of illustrations in rhino-laryngological publications.

This book has the peculiar advantage of being valuable in its subject-matter and instruction to the specialist and to the general practitioner alike. It must be mentioned that some of the chapters on diagnosis and special methods of examination are not handled in such detail as are the very valuable chapters on anatomy and pathology of the accessory sinuses and those on operative technic. The companion-volume on laryngology is promised shortly.

Die Syphilis der Nase, des Halses, und des Ohres.

By PROF. DR. P. H. GERBER, Director of the Königliche Universität-Poliklinik for Nose and Throat Diseases, in Königsberg. Second Edition. Pp. 144. with 4 colored plates and 1 illustration. Price, 6 mk. S. Karger, Berlin, 1910.

Perhaps no author in oto-laryngology has been more successful in the presentation of atlases of the pathology of our field than has Gerber. This is the second edition of his instructive and valuable monograph on syphilis of the nose, throat and ear, and includes the recent advances and research in this field; the etiology of syphilis, its more accurate differential diagnosis and special consideration of the symptomatology, pathology and treatment of luetic processes in the ear, nose and throat. The completeness of this monograph, the policy of the text, the beauty and naturalness of the colored plates are its pre-eminent features.

This atlas and monograph is equal to the best of colored plates that have as yet been published.

Les Maitres de l'école de Paris dans la periode pre-specialistique des maladies du pharynx, du larynx et du nez.

By DR. C. CHAUVEAU, Member of the Academy of Medicine. Volume 2; pp. 288. J. B. Ballière et Fils, Paris, 1910.

In THE LARYNGOSCOPE, May, 1909, we presented a notice of the first volume of our esteemed confrère and we are glad to note that Dr. Chauveau now offers the second volume of this interesting series of the masters of the French school, containing contributions and bibliographical sketches of Andral, Barth, Bayle, Cruveilhier, Sestier, Rousseau and others in special medicine; also Chassaignac, Dupuytren, Velpeau and others in surgery constitute the special chapters of this second volume. Each master is considered especially for his contributions to the field of otology and laryngology. This series, when completed, will form an unusually interesting and valuable reference to the development and history of oto-laryngology. The period discussed in Volume 2 is a pre-specialist era.

The Diseases of the Nose, Mouth, Pharynx and Larynx. A Text-book for Students and Practitioners of Medicine.

By ALFRED BRUCK. Edited and translated by F. W. Forbes Ross, M. D., Edin., F. R. C. S., England, Late Civil Surgeon, His Britannic Majesty's Guards Hospital, London, etc. Assisted by Friederich Gans, M. D. Illustrated by 217 figures and diagrams in the text, many of which are in colors. Pp. 615. Price, \$5.00. New York: Rebman Company, 1910.

By the diligent work of the translator, English readers may now avail themselves of the privilege of Bruck's text-book on diseases of the nose, mouth, pharynx and larynx. This book is intended to meet the requirements of the general practitioner and is written by an experienced clinician and scholar in special practice. Practically considered there is, perhaps,

too much condensation and omission of some subject-matter necessary to a complete text-book in this field. A noticeable feature of the illustrations accompanying this volume is the large number of partial schematic diagnosis and cuts to more definitely bring forth anatomical suggestions in technic.

The description of operative procedures is rather brief and the translation into English is scarcely classic. The bibliography and other details of the publishers' art are well carried out. Some of the half-tones might appear a little clearer.

The Propaganda for Reform in Proprietary Medicines.

Sixth Edition: Containing the various exposés of nostrums and quackery which have appeared in the *Journal of the American Medical Association*. Price, paper, 10 cents; cloth, 35 cents. Pp. 292. Illustrated.

This book presents in convenient form most of the exposures that have appeared in the *Journal of the American Medical Association*, showing fraud either in the composition of various proprietary preparations or in the claims made for such preparations. The book will prove of great value to the physician in two ways: 1, It will enlighten him as to the value, or lack of value, of many of the so-called ethical proprietaries on the market; and 2, It will put him in a position to answer intelligently questions that his patients may ask him regarding the virtues (?) of some of the widely advertised "patent medicines" on the market.

Hand-book of the Diseases of the Nose and Throat.

By EUGENE S. YONGE, M. D., Physician to the Manchester Hospital for Consumption and Diseases of the Throat. Cloth. Pp. 407, with illustrations. Price, 9 shillings net. Edinburgh: William Green & Sons, 1909.

If we were to indicate the feature that is pre-eminent in this volume, in the consideration of many new publications that have recently appeared in the field of rhinology and laryngology, we would say that the chapters referring to the functional pathology of the larynx and the consideration of tuberculosis of the larynx, were the especially prominent chapters of this hand-book. The author's long experience as a clinical observer at the Manchester Hospital for Consumption, pre-eminently qualifies him in the presentation of these chapters.

The plates are exceedingly good and for the greater part original.

Lehrbuch der Ohrenheilkunde.

By PROF. DR. OSTMANN, Director of the Universität-Pojecklinik for Nose, Ear and Throat Diseases in Marburg. Pp. 533, with 100 illustrations, 43 charts and 51 reliefs. Price, 18 mk. F. C. W. Vogel, Leipzig, 1909.

It is an especial compliment to say that this German text-book of otology is constructed and published along the lines of the American text-book; it is remarkably well edited, the classification of subject-matter is clinical rather than theoretical; the illustrations and drawings to elucidate the text are for the greater part original and well executed and the entire arrangement of the text is offered in a very able manner.

The bibliography is very complete with each chapter and the volume includes all of the modern research in otology. A special feature of this volume is the presentation of the author's own investigations and results in recording acoumetry in otology. The volume is a splendid contribution to the German text-books on otology.

